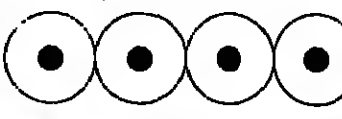


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NEWS IN BRIEF

Software for micros

THE first real time executive software to be developed by a microcomputer manufacturer for resident use on a micro has been released by Intel. Known as RMX/80, it runs on Intel's 8080-based configurations.

It is based on a modular, 2K byte block of code known as the Memory Resident Nucleus and a number of utility routines such as parallel and analogue I/O drivers, and drivers for the hardware mathematics board, diskette controllers and the like.

European links

DEMAND from Holland and Belgium for UK computer staff has led the staff recruitment firm John Goldsmith Computer Services to forge closer links through working agreements with local companies. John Goldsmith's contact in Holland is a software and staffing company, Computer Service Evers. A link with Belgium is now being arranged.

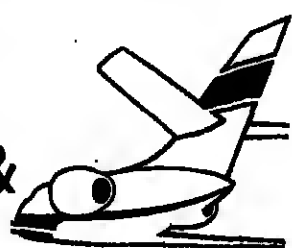
Koreans accused

A RETIRED US lieutenant-colonel has accused top South Korean officials of stealing up to \$17 million worth of US supplies a year since the early 1970s with the help of the US Army's Univac computer in Taegu.

FPS moves in

ARRAY processor manufacturer, Floating Point Systems, of Portland, Oregon, has opened offices in Reading and Geneva to market its systems in Europe. FPS products include the AP-120B which can interface with minicomputers and the AP-190L for use with mainframes.

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GE to enter packet switching business

THE International time sharing bureau General Electric is planning to become a common carrier offering packet switched network services. It is understood that the US company is already preparing tariffs for submission to the government's Communications Commission.

US observers note that, as the biggest time sharing network in the US, GE could enter the packet switching business with minimal investment. But they add that the company is likely to meet opposition from other carriers, such as Telenet, who could argue that GE is already too big and that it is not necessary for the government to license another carrier.

GE is said to be convinced that its existing time sharing customers would be interested in the cost savings and reliability of a common carrier's network, and the company itself would probably be a major user.

No one at GE was available for comment as Computer Weekly went to press, and Honeywell, which markets GE's Mark III time sharing network in Europe, said it had heard nothing of GE's plans.

Now Honeywell unbundles operating system

RELEASE of an enhanced transaction processing executive in the US shows Honeywell following the lead of IBM in unbundling software on the fringe of its operating system.

The existing transaction executive, which will continue to be supported, is regarded as part of the GCOS operating system, and supplied free of charge. The new software, Transaction Processing Executive-2, will be marketed as a separate, charged product.

The situation is radically different from that of IBM's charged performance and security enhancements to its MVS and VM/370 operating systems, in that Transaction Processing Executive-2 was not produced within Honeywell. It comes from Information Systems Consultants, of Virginia, and was originally developed for the International Brotherhood of Teamsters, the largest US trade union.

Honeywell pays a licence fee for the software to ISC, before re-licensing it to users. It is thus faced with a continuing cost,

rather than merely paying off the cost of a development.

UK release of the software is not yet scheduled, but in the US it will be available within the next three months for a \$35,000 single payment with an annual \$1,750 maintenance charge after the first year.

Transaction Processing Executive-2 is supplied for Level 66 and 8000 machines, and is claimed to be up to 50% more efficient than the existing GCOS software, as well as allowing greater user interaction with the system at run-time and providing more comprehensive statistics.

The Honeywell move also highlights a growing trend among hardware manufacturers to acquire critical items of software from outside sources. Honeywell already provides Cincom's Total database management system as a standard product.

Autumn boost for Eclipse

A MORE powerful version of the Data General Eclipse, the Model 50, is expected to be announced by the company in the autumn. It will come with a floating point processor and up to one Megabyte of main memory, and will compete directly with the Digital Equipment PDP-11/70 and the Interdata Megamin.

Holiday air strike vote

ASSISTANT air traffic controllers at the West Drayton control centre have voted overwhelmingly to strike from today (August 25) until Monday in support of their pay demand of up to 17%.

They had previously refused to provide input for the IBM 9020D air traffic control system from which flight progress data is produced.

During the go-slow, handwritten flight progress strips have been used.

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COMPUTERVIEW

Users can act now to shape their future

THE lack of a forceful and unified user voice has been a major industry failure for so long that no opportunity to unite should be missed.

Two recent initiatives should therefore be seized upon by all users — the Data Processing Management Association survey of user opinion on the Post Office (CW, August 4) and the EEC call for user groups to ensure that their names and addresses are on the EEC's files to assist in proper consultation in the future (CW, August 25).

Within the next weeks many users will be receiving the DPMA questionnaire which have been drawn up by Langton Information Systems Ltd, as an enlightened response to a request by the Carter review committee on the Post Office to comment on their recent report.

Instead of merely providing a critique by a select group of DPMA representatives, the association has chosen to seek the views of its members and the computer community at large.

By contributing to this survey, it is unlikely that any one user, or even all users together, can have a major immediate impact on Post Office.

But at least the survey will help to pinpoint the DP users' needs.

The questions cover a wide range of topics: the use of electronic mail, external databases, Viewdata, and the effects of communications costs.

As the DPMA says in the covering letter, "The questionnaire does not seek basic information which is covered adequately in other surveys, but is aimed at assisting the Post Office to respond to the information systems thinking of

THIS week's Computerview argues as many users and user groups as possible to respond to a call by the EEC for user group names and addresses for their files, and to the DPMA survey on user reaction to the Carter Committee on the Post Office.

User groups should send data to the Commission of the European Communities, DG III/B/2, attention Mr Geric, 200 rue de la Loi, B-1049 Brussels, Belgium.

Users who are not members of the DPMA and who would like to receive copies of the questionnaire should contact the DPMA at 27A York Road, Maidenhead, Berkshire SL6 1SO. Telephone: 0628 29678.

DPMA members.

The DPMA would, however, like to receive the views of as many users as possible, whether or not they are DPMA members.

The EEC request for user groups' names and addresses is particularly significant because it is aimed at laying the foundation for bringing about the creation of a united European user voice.

The Commission is determined to ensure that the user voice is heard more in the development of strategies relating to the computer industry and would like to see a single, united user body.

There are major hurdles to be overcome before such a body can be set up. And the prime one is that users, like most people, tend to be concerned with their own immediate self-interest problems.

That is why most user groups are manufacturers-based and are aimed primarily at parochial (selfish) important manufacturers' dependent problems.

It is difficult to get a user to take action over an apparently nebulous issue like electronic mail or international data flows, when so much time is spent on trying to get any kind of smooth data flow.

But unless the DP user takes some unified action soon, deci-

sions could be made by government, manufacturers or user departments that will affect them.

Filling in the DPMA or contacting the EEC are two simple ways of users taking up the opportunity to get involved in the decision-making process. Further action should follow and one looks, in particular, with some hope to the EEC's call for user consultation.

This concept should also be strengthened by broadening the view of what is meant by user. In terms of this Computerview, so far, "user" has been taken to mean the DP department. But there are other users, known variously as the end user, the user department, or, as was pointed out at IEP last month, the "user."

With the advent of minis and micros, the end user is increasingly becoming a direct computer user. And, after all, the computer system is there to meet the end-user's needs ultimately.

It is perhaps too premature to start asking for a united end user voice, when it is so difficult to get even the DP users together.

But in any discussion about users and user power, nobody should ever forget that the real power ultimately lies outside the computer department.

FOCUS

... on the industry's price-cutting war

THE current industry price-cutting war is gathering momentum. Few weeks seem to go by without details of fresh unrepeatable offers. Last week was no exception, bringing news that "DIY" computing kits were joining the price-cutting club (CW, August 25).

The fact that there was scope for reducing prices in this particular area may well have come as a surprise to DP professionals, many of whom were under the delusion that prices were already minimal.

As for mainframe computers the price-cutting cycle appears to operate in a well structured mode: Following IBM's price-cutting exercise, Telex and Irel lose little time in announcing their lower prices. This operation is quickly followed by news of yet another impending Japanese computer invasion of the US and Europe. Almost inevitably, IBM takes up the challenge and establishes new, lower prices. Telex and Irel meanwhile do not lag far behind in making fresh cuts.

By now the industry should be reeling in the cut-throat competition. DPMA's should be evaluating between taking advantage of the current Honeywell offer, or hanging on for a week or so for NCR's latest competitive prices.

Open and above board price incentives are new to the industry. Not so long ago, computer managers rather than the company cash flow were the salesman's target. The DPM in the market for a new machine was encouraged to visit a salesman in Hamburg or Amsterdam — and here it wasn't solely the attributes of the machine system which was revealed.

Potential purchasers of perhaps less costly systems would be invited to visit the manufacturing plant. An odd hour or so in the factory, followed by a visit to the Scottish Highlands, worked wonders for the sales graphs. Very often these "away-days" were more than a purchasing fringe benefit. They enabled the installation and sales team to get to know each other — a relationship that could be of critical importance for the future wellbeing of the DP system.

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Ten years ago...

COMPUTER WEEKLY
AUGUST 31, 1967

THE English Electric merger brought "integration" at the lower end of the range and the widespread System 4/10 without the officially announced £3000 family was made. Burroughs range, with the smallest, £1000, the largest, £3500, announced the P205, a version of the Pegasus desktop computer. A 10-year scheme to company PAYE scheme for 20 taxpayers got under way. Inland Revenue said that foreign tax relief, computer centres were in "unattractive areas". The first major planning exercise through a period time sharing was provided by Electric. An English 4/70 computer was the work done by a team of four machines, an IN 300/30 and 1401, and an Energy Authority. The UK's first computer was the 37 Shakespeare was to be produced at University Computing to KDF0 and published by OUP.

Minister challenged over ESA orders

THE row over the Employment Services Agency orders for US minicomputer equipment (CW, August 11) continues with the news that John Wakeham, the Conservative MP for Maldon, Essex — has written to Employment Secretary Albert Booth about the affair.

This follows the strong attack on the ESA and on the Central

Computer Agency by another MP, Eric Moonman (Lab, Bedford) who described the decision to buy US equipment for the job vacancy message switching systems instead of UK-built kit from Digico as "uplifting". Moonman has already been in touch with Booth asking him to intervene.

The Department of Em-

ment has acknowledged receipt of the complaints from both MPs but as yet is unable to comment on the matter.

Wakeham told Computer Weekly that he did not regard the issue as party political and said that he would probably liaise with Moonman as it developed.

He believed that if the matter was not resolved by the time Parliament reconvened at the end of October questions could be asked in the House.

Wakeham has sent Booth a copy of the Computer Weekly story about the ESA orders, together with a letter pointing out that, while he was not an expert on the computer industry, he would be interested in Booth's comments.

So far the Employment Services Agency has ordered two message switching systems for disseminating job vacancy details among Job Centres. These are to be installed in London and Glasgow and, in both cases, the supplier chosen was Interdata. The equipment ordered includes about 100 US built daisy wheel printer terminals.

Digico's unsuccessful tenders included matrix printer terminals manufactured in the UK by Dico and Trend as well as its own Micro 16E minicomputers.

Message switching systems for about 10 more contributions could be ordered by the ESA — the next two probably being Newcastle and Liverpool. Digico intends to bid for these contracts.

Hotel Poster from NCR

INTRODUCED by NCR is the 250-8000 Hotel Poster, which gives front office control over hotel transactions, from advance bookings to gift shop purchases.

It has programmable print positions with two column print, room rate look-up turnover figures for particular departments and a cassette recording capability.

older machines, Sharp was looking for up to three times better throughput at about the same cost as the 145s (CW, October 2, 1976).

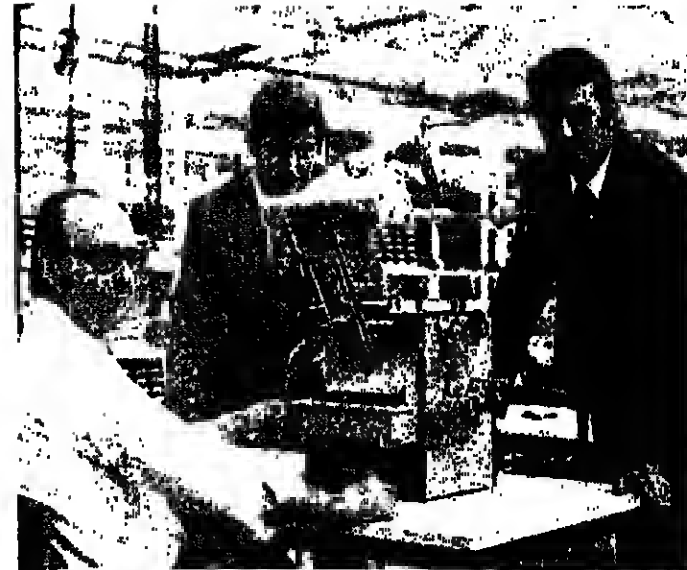
The operating system used by Sharp is based on version 27 of DOS with several in-house enhancements. The Power spooling package, also enhanced in-house, is used.

The North-east Florida regional data centre in Gainesville has replaced its IBM 370/168 with an Amdahl 470V/8, which is to run under OS/MVT and use the Hesp communications package. The machines will be used for the full range of educational applications by the Universities of Florida and of North Florida.

In the early 1970s, Memorex tried to challenge IBM with a pair of medium scale mainframes aimed at IBM's smaller 370s. That attempt was abandoned, but Memorex is supporting Amdahl by replacing its two 370/155s with a 470V/8.

Other recent Amdahl 470 deliveries were made to the Bell Telephone Company of Pennsylvania, Burlington Northern Railroad and Exxon Corp, which trades under the Esso name in Europe.

First deliveries of the smaller 470V/5 are to begin next month with systems going to two as yet unnamed customers.



MEET the ideas man... Ken Bruce from the production engineering department at Honeywell's Newhouse factory, Strathclyde, is seen seated at the machine designed for producing pre-formed components for printed circuit assemblies. He has also won a prize for a new method for improving the yield on soldered circuit boards. Bruce's ideas were put forward under the factory's cost improvement programme and were much appreciated by the technical operations manager, Tom Frame (centre) and George McNeil, director of Newhouse computer operations.

GEC wins minis order

THE order for minicomputers to replace the 10-year-old IBM mainframe at London's University College has gone to the UK manufacturer GEC. The other companies competing for the order were Prime and Digital Equipment (CW, August 4).

Three GEC 8042 will be delivered during the 1977-78 academic year and another two or three will probably be added later. No configuration details have been worked out yet but the college has said that the processors will be linked.

Extras for Olympia machines

NOW available as optional extras for Olympia Business Machines SGE 65 and SGE 85C typewriters are a decimal tabulator, micro typestyle, Arabic script and a 24 inch carriage. The ten-key tabulator is said to be a time saver for the typist when it comes to financial/accountancy listings or form filling. It costs £40 plus VAT.

Of interest to those who wish to obtain the maximum amount

of typing on a single sheet, the micro type, said to be the first available to the new international standard, gives 15 letters per inch and costs £46 plus VAT.

Reflecting the growth in the export market to the Middle East, Olympia has also introduced Arabic script, while wider jobs can now be handled with a new 24 inch carriage. Respective prices are £72.50 and £221 (on the price of 13 inch model).

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DOWNTIME



Computer-influenced Liverpool in winning form.

Why 'the Reds' are off to a good start

IF Liverpool wins the Football League championship again this season it might be because the team paid £400,000 for Kenny Dalglish in the summer. Or perhaps because Steve Heighway in particular has reportedly started the season in top form.

But whatever effect individual players have on the team's fortunes, the Football League's computerised fixture selection system is likely to be one of the most important influences.

For it is this system—run by a bureau which prefers to remain anonymous for fear of being flooded with requests for fixture details—which draws up fixtures for the 92 league clubs, in four divisions.

And the system has already helped "the Reds" at Liverpool get off to a good start by giving the team two relatively easy first home games against Newcastle United and West Bromwich Albion, saving likely championship contenders such as Manchester United and Ipswich Town for later.

The Football League started to compile the fixtures by computer about 12 years ago merely to speed up the process, said Alan Hardaker, general secretary.

"Before that they were prepared by a full-time member of the Football League staff and two assistants using a copy-right formula. After considerable preparatory work, the actual compilation took about two weeks. The preparatory work still has to be carried out by Football League staff, but the compilation is much quicker."

The preparatory work includes ensuring as far as possible that teams playing away at Christmas and Easter do not have to travel too far. Each team can name one other team it does not want to clash with on home games, and this too is taken into account at the input preparation stage.

The League also tries to ensure that fixtures are not played in the same order as the year before.

The computer system produces individual club fixtures

lists and a chronological list of all fixtures. The lists are sent to clubs for comments and requests for changes are made where possible.

The preparation of data for a season's fixtures starts in the previous March or April. The fixtures have to be ready well in advance so that clubs and other organisations can prepare season tickets, advertisements, pools coupons and so on.

Because of this, a league newcomer this year, Wimbledon, in south London, has had to accept fixtures prepared for the club it replaced, Workington, 270 miles to the north, in Cumbria. This has given Wimbledon a lot of travelling at Easter and Christmas, according to club chairman Ron Noades. One of its away games at Christmas, for example, is at Rochdale.

Even well-established clubs do not always get their own way. Bobby Roberts, manager of Colchester United, bemoaned the fact that his team had to travel to Bury on December 27 after a home game the day before, and Bill Dodgin at Brentford recalled having to travel to Workington for mid-week evening matches.

London is one of the most congested areas as far as football clubs are concerned, as West Ham secretary Edwin Chapman pointed out.

"We ask for our games not to clash with those of Spurs," he said. "But then Spurs don't want to clash with Arsenal. And we've got Orient just down the road."

So when your team wins the first division or gets promoted this season, don't put it down merely to them being a great bunch of lads, or believe Jimmy Hill's claims about that 80th-minute penalty on a muddy November evening being the turning point.

Remember that computer.

The recent Hedor Park conference organised by Computer Weekly and the British chapter of the ACM, entitled Can Computers Save Britain? (CW, July 14), gave fresh impetus to the move for the establishment of a clear policy for computing in the UK.

One of the people who responded to the Computer Weekly Call for Action to define and support such a policy was Malcolm Ballantine, who lectures on ergonomics and the effects of computers at work for the Department of Occupational Psychology at Birkbeck College, London.

Mr Ballantine explains the impact of information technology on society as a subject of importance, and why it has not made widely known.

How can 'non-workers' be educated?

FOR behavioural scientists, the call for an overall policy on the introduction and application of computers in the UK raises another problem. How can we make the ever-increasing number of computers in our midst more amenable to people?

Once again we are faced with the complexities which make the problem so difficult to solve. As a behavioural scientist who has been professionally concerned with these matters for some years, I would like to add my point of view to the debate.

On the surface, at least, there is an immediate problem to be overcome. Many people find computers difficult to understand and are further discouraged from trying to understand them because of the difficult vocabulary used by those who do understand them.

On the other hand, the effects of computing are probably even more complex—and many of the issues which arise are not directly related to the machines. Society as a whole must make the decisions which will have to face in the immediate future, yet society as a whole is not at present able to make those decisions.

An analogy comes to mind, that of the internal combustion engine. In the days of horses we had roads and we had vehicles. In the last 50 years we have seen from the development of roads and road transport systems one of the most obvious changes which the human race has ever imposed on the surface of this planet. These changes have come about because of the internal combustion engine.

We have always had communication systems and the checks and controls which enable us to run our society. These are about to be transformed in a way which is at least equal to the changes we have seen in road transport.

And yet our approach to these problems seems at present to ignore the opinions of the vast majority of ordinary people who are affected by the changes, to cut off our decision-makers from the information they need and to use the analogy, to proceed to design a motorway network in terms of caraburators settings and exhaust design. It isn't going to work.

People at large must become more aware of the impending changes. Computer professionals, in turn, must be more open, less being done, and, above all, take a far less narrow view of the effects of what they are doing.

It is all very well making bold statements like this, but they are only one man's opinions, and they beg more questions than they answer. Let us look a little deeper. There seems little doubt that the most profound effects will, at least in the next 10 to 15 years, be on our working lives.

In a broad sense, three areas of questions that need to be faced up to here. What should our employment (or unemployment) policy be? Is 100% employment our primary objective? Or are we capable of, and prepared for, change that must otherwise take place in our attitudes towards unemployment?

To put that last point in the most down-to-earth way: how quickly can we rid ourselves of the feeling that getting money without working is scrounging? That is what any plan which does not accept 100% employment will have to get as much money for doing nothing as for working. Where does that put our contemporary notions of motivation and incentives?

What sort of education do our children need? How do we



MALCOLM BALLANTINE — Computer professionals... must be more open... and take a less narrow view of the effects of what they are doing.

educate the "workers" for their rapidly changing jobs? How do we educate the "non-workers" for leisure? The young adults of the early 1970s are in infant school now, yet many of them are getting an education fit for the 1990s.

Educational evaluation has traditionally thought in terms of necessary knowledge, skills and attitudes. This analysis is becoming difficult to make.

From a humanistic, and democratic, point of view the overall question to be answered here is "what do people want?" Yet even the mechanisms for finding the answers are not clear.

We can take a narrower point-of-view and look at the individuals in our society. What sort of jobs will the "workers" have? Will we have technology to be the sole determinant of tasks, from which jobs are then assembled? Or do we design jobs and then adapt our technology

to suit the people? The former approach, predominant to date, is a paradox in the process. In the process, the tendency has been to see machines as more reliable than humans. Very often the machine has been used to monitor-check, intervening only when necessary. Total automation, difficult and the risk that it will be many years, people can be replaced.

The paradox arises: the level of automation so does the level of this. In turn, the efficiency of the operator, so the goes, and the efficiency system as a whole falls. There is an optimum automation which is not the maximum automation.

The truth of this is, has not been everyone's satisfaction industries where the said to occur, and yet for automation of jobs have so far been limited on a scale far wider than ever been previously seen.

The pessimists argue a widely-held notion of a reality of technology and that, to the technology is not only based in effect but those with power in it retain and increase it. Certainly the social raised by the future of the development are a What is happening in doing it? Who are the for? Who is to gain? Who loses?

Yet these issues seem those which are most ignored by systems design, and, for that matter, behavioural scientists concerned themselves with computing.

If we are to progress the issues with which we start. There must be a dialogue between the and people at large. To the analogy, vehicle exhaust emission are as carburetor settings and design. At motorway, however, the real issue do with other things.

A Wordplex 7 shared logic word processing system has been bought by the Central Computer Agency as part of its programme exploring the applications of computer aided typing. CCA director Reay Atkinson is pictured on a visit to the Department of Education and Science, Darlington, where the system has been installed. Left

to right with two members of the typing pool are: Chris Helmen, government sales manager, Wordplex; Kenneth Baker MP, a director of Wordplex; Mr Hallett, controller, DES Darlington; Reay Atkinson; Harry Mithren, managing director of Wordplex; and Derek Eldridge, head of systems consultancy division, CCA.

Under its contract with Honeywell's Minicomputer and Terminal Division, CFL is also being supplied with a complete range of peripherals. CFL points out that all Honeywell hardware installed with its customers will be maintained by Honeywell's own field engineering force.

Applications software for CFL's Level 6 customers will be produced by another Coventry firm, Simdall. This is a software house specialising in small commercial systems which already works with CFL's TOM customers.

Simdall will convert an existing range of applications packages already available in commercial: Fortran, for TOM, to Cobol 74 for Level 6. These will run under the GCOS 8 operating system.

OP SPOT

... this week looks back to the days when man was master of the machine — and the subsequent reversal of roles.

OPERATING systems, who really wants them? Is ICL's George better than IBM's OS? Or vice-versa?

Back in the "good" old days, when OS meant Oh! Sugar and GIS was still being hatched, operators had great fun. Console logs could be "doctored", and audit trails existed only in the outback.

The machine needed men. The machine was our slave, and we were the masters.

How things have changed. Today, operators run around in ever-decreasing circles, trying to obey the machine as quickly as possible.

How fast have the roles reversed? Nowadays, there must be a whole generation of operators who think that the operating system is a vital part of the machine — a standard feature.

How many people have experienced both the IBM and ICL variants of operating systems? This must be confusing, for they have totally different approaches.

It would be interesting to hear from members of the computer fraternity in general, and operators in particular, of the problems encountered in using both systems.

So, dig deep into your operating system and tell us about the problems — or anything else you care to remember. So long as it is printable.

IN the discussion on software manuals in Op Spot (CW, July 28) you state that "often they list hundreds of irrelevant facts yet fail to show the actual information required".

It is always a problem to know what is the required information, and what is irrelevant, particularly since no two users ever agree.

For this reason we provide comment forms at the end of each of our technical publications.

IN the last six months, despite a major software release, only about 20 of these forms have been returned. Because of this low response we have recently carried out an inquiry, involving visits to nearly every European country, to find out what users

think of our publications. It is our aim to provide our users with the documentation they require. Whenever comments are received they are acted upon in the next revision, or if a significant omission or error is found, an addendum is produced specially to remedy the situation.

STEPHEN HOPKINS, Senior Editor
CII Honeywell Bull
Paris

LETTERS

Always a problem to know what is required

Solutions for the accountant

Just one criticism

Scanners cut costs

LETTERS

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Solutions for the accountant

JOHN AMBLER, in the opening article of Computers and Accountant (CW, August 18), has, in limited space, done well not only to highlight the scope now available to accountants to limit today's drudgery but also the scope that could be available to them to pioneer the future.

His comment, however, that "it is extremely difficult to determine the power and flexibility of such a system (general ledger) from the sales literature" cannot go unanswered.

Perhaps there is some truth in this but any system adopted by such diverse organisations as Rank Xerox, the Stock Exchange, Massey Ferguson, Willis Fother and London Transport must speak for itself, and perhaps the real hubbub is that some accountants and DP specialists are unwilling to admit

that an "off the peg" solution can be as all-embracing as the one they have developed and then have to maintain themselves.

One can understand their dilemma, but it is a fact that developments in packaged systems have been substantial over the past five years, and the new user not only can plan his implementation schedule with certainty but also knows his financial commitment.

ROY P. TAYLOR, Chairman,
Packaga Programs Ltd

THANK you for the reference to NCC's book "Planning for Standby" in the Focus article on independent power supplies (CW, August 4). In view of the praise for the "otherwise admirable book" it may seem petty to jibe at the one criticism but, in fairness to the NCC Members' Working Party who wrote the report, may I direct Focus to pages 35-38. He may have missed this chapter on his final reading but I feel that power supplies are given more than a mention, both in the text and in the checklist.

I was pleased Focus chose to bring this lesson of the New York situation home to British readers. Security is so often neglected until the misfortunes of others lead us to safeguard our positions.

L. P. WARING
Senior Consultant
NCC Security Unit
Manchester

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Scanners cut costs

COMPUTERISED medical X-ray scanners can more than halve the cost of diagnosing growths in the body and reduce the length of a patient's stay in hospital by 25%. These facts emerge from a study of nine US hospitals, carried out by EMI, UK's world leader in X-ray scanners.

The study found that information gained from scans eliminated the need for many other tests and in many cases made exploratory operations unnecessary, thus cutting a patient's stay in hospital from 17 to 13 days.

Average diagnosis costs were reduced from £3,000 to £1,120 for an abdominal growth and £3,700 to £2,000 for a pelvic growth.

£40,000 profits

PROFITS of £40,000 on a turnover of £400,000 for the year to July have been announced by Datapro, the data preparation bureau. Company expansion during the last year has included the replacement of an ICL Key Edit 100 system at its Kingston branch with a 12-station ICL 8859 system.

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TELEX

Microprocessor News

Elevator control for high rise buildings



US Elevator's William Hoelscher holds the microcomputer system designed to control eight elevators. Behind him, one of the three electrical cabinets that the system replaces.

ONE of the classic control applications for the microprocessor, discussed in detail at many a seminar, is the elevator in high rise buildings. Now US Elevator of Spring Valley, California, has produced one, and ironically is finding little opportunity to apply its expertise.

The US Elevator system, the work of William Hoelscher, the firm's chief electronics engineer, is capable of controlling the operation of up to eight elevator cars serving buildings with a maximum of 48 storeys. Since not all elevators stop at all floors in high rise buildings, the eight can be stretched to cover a 100 storey building.

GIM debugging system

A PROGRAM debugging system for use with the PIC 1650 single chip microcomputer has been introduced by General Instrument Microelectronics. Called the PIC 1650 development microprocessor, the system provides access to an external PROM program store.

In this way, operating programs for the 1650 can be tested before being committed to the device's on-board, mask-programmed ROM. The PIC 1650 is identical to the 1650 with the exception that the on-board ROM, which has a capacity of 512 by 12 bits, has been removed from the chip. Instead, the ROM address lines are brought outside the package for connection to the PROM.

Euromicro 77 symposium

NEW concepts, recent developments and future technical possibilities will be among the subjects covered at Euromicro 77, a conference being organised by the European Association for Microprocessing and Microprogramming.

To be held in Amsterdam, from October 3 to 8, the conference will range over a variety of subjects in the micro area, such as microprocessors, bit slices, microcomputers, microcomputer software, microprogramming, multimicroprocessor systems and formatting.

Intel's control device

A microcomputer-based peripheral control device has been introduced by Intel that can be used with any microcomputer system employing a standard bus structure.

Designated the 8041 Universal Peripheral Interface (UPI), the device controls peripheral handshaking and protocol functions such as pre-processing of data, error-checking, and conversion, arithmetic operations and formatting.

It comprises a CPU, 1K bytes of program memory and 64 bytes of read/write memory. Data transfer between the system and the UPI takes place via the data bus and an on-chip 8-bit data buffer. The device uses two 8-bit programmable I/O ports for interfacing with the outside world and can be expanded by using the type 8255 which can be expanded to provide virtually any number of lines.

market place

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FILE DESIGN

Storage devices

By Owen Hanson

Part 10

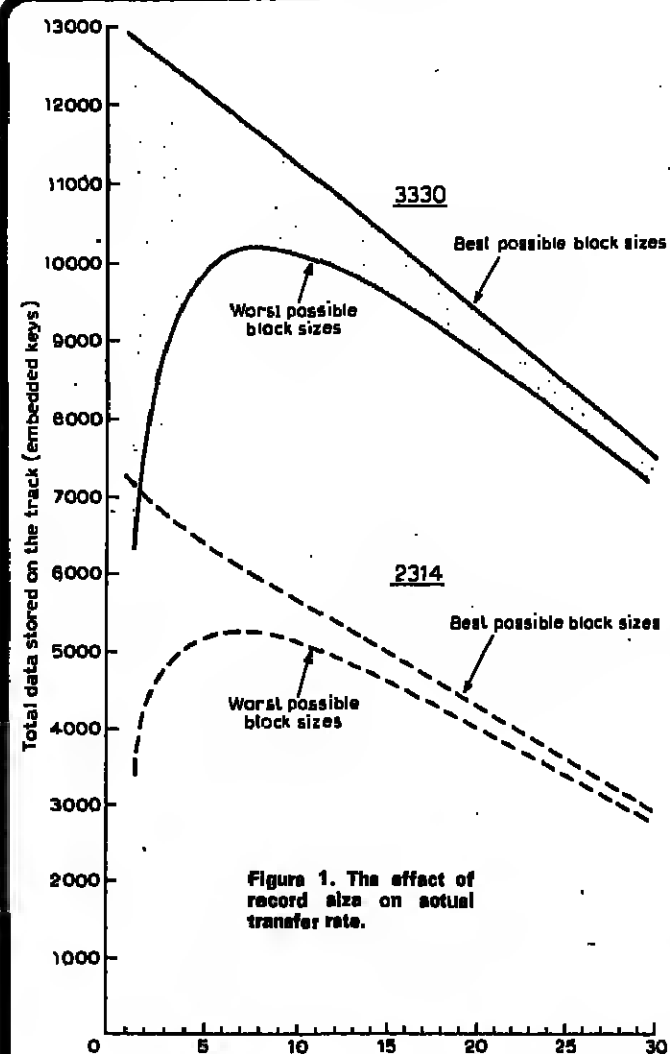


Figure 1. The effect of record size on actual transfer rate.

IN theory the file designer should consider a number of media before deciding which to use. In practice the choice usually lies between magnetic tape and removable disc.

Drums and fast fixed-head discs are limited in capacity and therefore most used for table or index storage. Magnetic card devices such as CROM or data cell provide slow access but massive storage capacity. Their relative lack of speed and reliability has led to the substitution of the modern fast, very high capacity removable discs in most cases, although they can still be found in insurance applications. The National Insurance Installation in Fleetwood uses CROM, for example.

The range of discs and tapes available is very wide. Table 1 gives details typical of devices that are available from most major manufacturers.

Magnetic tapes

The data given in Table 1 covers most modern tapes, although users may still have slower, older equipment. Recording densities of 800 / 1,600

characters per inch imply that a potential storage space for 480/960 bytes is lost in each inter-record gap.

The cost of this is minimal due to the low price of tapes; however, its effect on transfer rates is very marked, and it reduces the storage capacity of a tape, usually 2,400 feet in length, which may lead to the file requiring further tape reels. The importance of this was discussed in Part 2.

Transfer rates specified are always maxima. They are reduced by the time taken to traverse inter-record gaps as shown in Figure 1. Note that, unless record sizes are large, the actual transfer rates will be much lower than the figures quoted by manufacturers. In addition, the curves given assume that a further tape read instruction is issued in time to avoid the tape drive mechanism stopping. If it does stop, the waste of time is greater.

For example, a Univac Universal 16 will traverse a gap in 5.0 milliseconds, but a physical start-stop will take 8.0 milliseconds. Corresponding figures for the Univac 20 are 5.0 and 3.0 milliseconds respectively.

The effect of record size on the length of tape required is the inverse of its effect on actual transfer rates. For example, if the actual transfer rate is 25% of the figure given

by the manufacturer, the file will take up four times as much space on tape as it would do if there were no gaps at all.

Discs

Blocking records on disc can crucially affect performance, as has been stressed repeatedly in this series. Because of the many gaps introduced by multiple records on disc, larger blocks make better use of the available storage space.

The size of block chosen is important. Figure 2 shows the effect of block size on the data capacity of IBM's 3330 and 2314 discs. This makes it clear that it is vital to choose appropriate blocking factors, particularly for large blocks.

The manufacturers usually provide tables and formulae that the user can employ to estimate the effect of any given blocking factor chosen. Figure 2 emphasizes the meaning of these tables, and the user may find it helpful to construct one for his own devices.

Discs do not have a direct equivalent of the tape start-stop time. In that the gap between two records will be traversed in about 0.025/0.1 milliseconds, and the disc spins constantly, so avoiding stop-starts.

However, this very rapid transition from one record to the next makes it likely that the next record will be available before it is required.

Choice of media

Usually the access requirements of the file will force the designer to a particular type of device, and he will usually be involved in choosing appropriate blocking factors. Occasionally, size is more important and was discussed in Part 2.

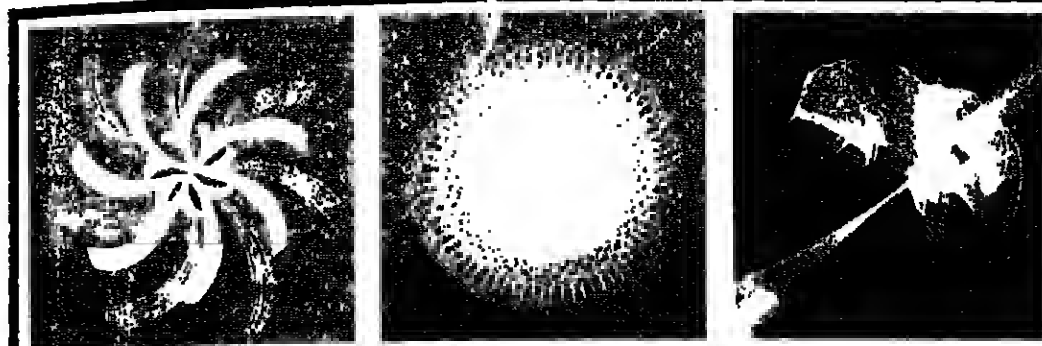
The implications of a choice of actual transfer rate on space required for the file and on backup and system operation will be checked by referring to data supplied by the manufacturer. Suitable use of devices available will mark dividends in improved performance.

THE AUTHOR, Owen Hanson, is responsible for the design of the data processing systems at the City of London School, London. He has 10 years' experience in data processing systems analysis and design, and is a member of the City of London School, London. He has 10 years' experience in data processing systems analysis and design, and is a member of the City of London School, London.

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Device	Head movement times (milliseconds)			Rotational delay (milliseconds)		Capacity (100,000s of bytes)		Transfer rate (1000 bytes per second)
	Min	Average	Max	Average	Maximum	Disc	Module	
DISCS								
Medium (IBM 2314, ICL EDS 30, Univac 8414)	25	60	130	12.5	25	28-30	230 max	312
Large (IBM 3330, ICL EDS 100, Univac 8430, Honeywell M80 0451, CDC 33301)	8-10	30	55-60	8.4	16.7	100	800	800
Very large (IBM 3340, 3360, ICL EDS 200, CDC 33302-11)	10	25-30	50-55	8.3-10.1	16.7-20.3	200-320	1600-2500	800-1000
MAGNETIC TAPES								
Recording density (bytes per inch)								
Inter-record gap (inches)								
Start/stop (milliseconds)								
Rewind time (seconds)								
VARIOUS	566/800/1600	0.6		3-20		36-180		12-200

Table 1. The capabilities of a range of storage devices typical of those on the market.



Some of the Laserium patterns.

Tour of London laser lights

Lovelight, a laser musical: Metropole Theatre Victoria.
Laserium: London Planetarium, Marylebone Road.
Laser light circus: New London Theatre, Drury Lane.

FOLLOWING on the success of the Royal Academy's Light Fantastic exhibition earlier this year — to be repeated in 1978 — London suddenly has three concurrent laser entertainments. They differ from each other as widely as the many applications to which lasers are now crucial — brain surgery, industrial processes, navigation and communications, nuclear science, and so on.

Laser is an acronym for Light Amplification by Stimulated Emission of Radiation. Unlike any other form of light, whether sunlight or artificial, it is essentially monochromatic, coherent and capable of near perfect collimation — with the sides of the beam remaining almost parallel rather than diverging.

Lasers can produce continuous light or short bursts lasting less than a millisecond. Conceived in 1958, it used to be a standing joke that the laser was an exciting development in search of an application. Holography is now one of a long list of laser applications. A hologram is a reconstruction of an object or scene as a complete three dimensional image. The recording is made on a light sensitive photographic plate which can then be viewed when illuminated with laser light. It differs from a photograph, in that a hologram gives a depth of scene in three dimensions. However, it is not merely stereoscopic; its stereo picture does not change with different viewing positions. For a hologram behaves like a real scene and the spatial relationships change when viewed from different angles. There are both horizontal and vertical parallax.

The multiple type of hologram — photographic information stored holographically by combining frames of film taken from each angle — yields either horizontal or vertical parallax depending on how the camera was panned round the subject.

For by altering the angle of reference to the plate for each recording, a hologram plate can store more than one image, each becoming visible and then disappearing from view when such a plate is rotated through the reference beam.

The complete converse also holds: each fraction of the plate holds the entire recorded image from its own viewpoint so that if a plate is broken any piece will still reconstruct the entire image when illuminated with the reference beam — though the perspective is limited. I first saw this demonstrated, with literally shattering dramatic effect, at IFIP in Edinburgh.

The recording is made in the blue-green light of an Argon laser, the image will appear both larger than the original and nearer the plate when viewed in the red light of a Helium-Neon laser.

Dennis Gabor first conceived the theory of holography at Imperial College as recently as 1947. We are this only just beginning to exploit holography (the film "Logan's Run" included a hologram of Michael York, for instance) but the UK should very shortly see orthoscopic Real Image holographic advertisements. I am told Courtauld's are likely to be the first, and even the ghost in Hamlet will soon be portrayed by holography.

THE METROPOLE

This poorly advertised show takes its name "Lovelight" from the theme song, which is probably the best thing in it. Immediately opposite Victoria station, a filmed show accompanied by overloud musical effects, traces psychodetically and with occasional snatches of breath-taking beauty, fast-moving images from the drawing board broken into four colours: red, green, blue and yellow. These are projected on to a massive aluminium saucer suspended vertically across the auditorium. Both the images and the music are fast and insistent. They are loosely linked into the story of Man from tribal primitive to space explorer — but if you lose the thread it really does not matter.

The technique employed was to start at the drawing board, then translate the drawings into electronic signals via a graphic computer system which records the signals onto magnetic tape which is then mixed and synchronised (not always entirely successfully) with the soundtrack for automatic playback.

This tape is then used to control the mirrors directing the laser beam on to the projection area so as to reconstruct the images for the audience. Most of the effects are pure abstract; others like the fish, tortoise and higher animals, including Man, are based on artist's drawings.

The far from smart theatre was poorly attended. Summary: Children 8-14 would love this show. Monday to Saturday 2.30, 4.45, 6.15, 7.45, 9.15 pm. Sunday 3.15, 4.45, 6.15, 7.45 pm. Tickets: Adults £1.25; children and pensioners 80p; school parties 70p plus one free pass for any adult accompanying 30 children.

THE LASERIUM

In complete contrast, the Laserium is presented in ideal conditions at the Planetarium with its air conditioning and specially designed seats for recording. It will appear the same size as the subject. But if,

position at Madame Tussauds by Baker Street station mean long queues unless you book ahead, since each house is filled to its 400-plus capacity.

The adult audience is young, silent, rept. This is no filmed show but a reactive performance by the laser artists at a computerised console who project a collage of purely abstract colours choreographed to music on to the dome of the planetarium — sometimes plain, sometimes starred by the central Zeiss monster. During the classical parts of the concert, while the Blue Danube plays as if forever fresh, the images dance and swirl in delicious harmony; the abstracts (seemingly three dimensional though not in fact holographic) in complementing the Neptune theme from Holst's "The Planets" add a completely new dimension to the sensual experience. I found the synthesised rock and modern items imaginative and magnificent, especially in the Pulsar number, and yet without the same suspension of disbelief.

Summary: Forget the technicalities. Forget everything but the experience. Reining exhilarating experience not to be missed. Monday to Thursday 8.00 and 9.15 pm. Friday and Saturday 7.00, 8.15 and 9.30 pm. Sunday 7.00 and 8.15 pm. Tickets £1.50 on sale on the night but better to hook up to two weeks in advance by personal application at the box office. The show is likely to be closed next February so telephone 01-488 2242 for booking enquiries.

NEW LONDON THEATRE

The third and only British laser show in London at the moment is presented by Holoco, the new enterprise whose directors are Nick Phillips, Anton First and John Wolf.

The opening of the Laser Light Circus has been much delayed because of the GLC checks and double checks for safety. Knowing that lasers are used for spot welding metals, one can understand the caution surrounding a show which could occasionally sweep the light across your face.

The main theatre has been converted into a circus ring some 20 yards across surrounded by a high plain wall and together with some two dozen others we were free to walk around within this arena or to just sit on the floor. The show, controlled by computer tapes, comprised synthetic beams coming from several sources and reflected by two contra-rotating cuboid mirrors suspended centrally. This gave us a technically superb display of laser beams, sometimes with multi-colour effects, sometimes sweeping in broad arcs to form a lattice-work of light, sometimes swirling in Lissajous figures. For the first time, I was conscious of

just how straight a straight line can be: just the particles in the air make the beams appear completely solid. For the first time I found physical, as opposed to mathematical, beauty in the projective geometry; but I also found the floor extremely hard. The 25 minute show, basically a technological show-off, in no way compares with the relaxed artistry of the Laserium.

The New Theatre is part of a centre, with restaurant, pleasant foyer and bar. After the show we looked at the exhibition of holograms, which included one of an unstable subject (ie of people).

Summary: Worth a visit if you are interested in lasers or

holograms. Check by telephone (01-405 0072) how science is triumphing over bureaucracy before setting out otherwise, as on my first visit, you may find the theatre closed. Planned to be continuous from noon till 10 pm daily. It is currently only from 4 to 10 with the main show starting on the hour. Admission £1.20 (80p for children).

CONCLUSION

One can go to any of these shows just for fun, for the novel sensation, or as mere scientific curiosities. The Laserium is strangely relaxing and I cannot recommend it too strongly.

Busy senior executives can see one or two holographic



marvels at F International's presentation suite at Datafair from October 4-6. Also the BCS Specialist Group for the Disabled will, among more serious demonstrations of the Optacon, which enables the blind to "read", a prototype MATE terminal and NPL's MAVIS, be doing computerised portraits in Datafair's Technology Corridor. But as an artistic experience, there is nothing to beat the Laserium.



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Language translation by computer

By Walter Goshawke

FOR two decades research has been going on with varying intensity into language translation by computer. So little has been achieved that many people think the task an impossible one. Are they right?

There is no doubt about the need for computer translation. Many periodicals appear regularly in two or more languages. Many others are translated into the local language by local linguists immediately on arrival from abroad. International conferences on all possible subjects are constantly occurring.

Above all, more and more products are being exported to more and more countries, involving more and more business correspondence between speakers of different languages. Powerful computers are readily accessible almost everywhere. If a satisfactory system of computer translation were in operation, it would constantly be in use.

Wherever there is an insistent need, research usually follows. About 20 years ago research began on a lavish scale into computer translation. Millions of dollars were being spent in the early days, but far less now. Very little success has been

achieved, and this has resulted in a feeling of pessimism which is extremely widespread and extremely intense. Many computer people feel that computer translation is impossible and no further research into it can be justified.

I completely disagree with this view, and my reasons for saying so make a long story. Ever since boyhood I have been fascinated by foreign languages. Almost every day of my life I spend some time either learning a new language or relearning an old one. Like the crossword addict who must do a crossword every day, I have a similar sort of addiction for languages.

I remember pondering sadly that by the time of my retirement all the problems would have been solved without my aid. I was wrong, of course.

All aspects of languages fascinate me, but I particularly

love the rich variety of ingenious, inconsistent and strange devices which make up the grammar of languages. A new language is always full of colourful surprises. In spite of this luxurious variety I have always found that whatever I want to say can be said accurately in any language. It was inevitable that when I became interested in computers, translation was one of the things I thought of almost immediately. In the early days of the British Computer Society and before there was a great deal of talk of computer translation, and I always attended any meeting I could where it was being discussed.

There were a number of theories as to how it should be done and the prevalent feeling was one of optimism. I shared this optimism and would have dearly liked to start researching immediately.

However, that was impossible at the time and I remember pondering sadly that by the time of my retirement, then 20 years away, all the problems would have been solved without my aid. I was wrong, of course. I am now nearing retirement and there are still many problems.

I should also be wrong in thinking I was also to wait so long before starting researching myself. Ten years ago, I started computer translation research as a hobby and I have pursued it ever since with the same sort of dedicated enthusiasm which some people give to bridge or chess. I have been allowed free computer time by a number of different business users to the extent of about ten minutes a week throughout the period, and I am most grateful.

I have always had as my first major objective the translation of business correspondence. I am employed in business and am familiar with business correspondence. Among its advantages from the research point of view, two are outstanding: the limited vocabulary and the relatively simple sentence structure. Another advantage is that in office people are accustomed to modifying their procedures in order to make them more readily acceptable to computer operations. This is absolutely essential in language translation.

On the other hand, there are limitations. Programs and storage space used must be minimised and the results must be accurate. These and other considerations have led me to adopt an approach to computer translation different from that of other researchers.

Among the most far-reaching differences are: removal of ambiguities in input; universality; accuracy of definition of all details; stages of vocabulary and grades of difficulty.

Spoken languages abound with ambiguities of a number of kinds, most of which are resolved almost subconsciously in the human environment by an examination of the context. If unqualified texts are presented to a computer for translation, it

WALTER GOSHAWKE, chairman of the British Computer Society Natural Language Translation Specialist Group, writes about the research which has been going on into language translation over the last two decades. So little has been achieved, that many people think the task an impossible one.

Are they right? By way of answer he describes his own fascination with languages and the work he has done in

the field.

Goshawke adds, "I hope to do my researches during my retirement and I also hope to persuade others to take up the research, both in England and in other countries."

He hopes that many people will become sufficiently interested to tackle the research, and that language translation problems will, in due course, be featured regularly in the computer press.

"cat" If you catch a bird, a mouse and a cat, you need only one verb. If you catch a train, a butterfly and a cold, you need three. Similarly, programmers in other countries have to know the peculiarities of their respective languages, and program accordingly.

Business correspondence must be accurate; otherwise it is useless. I have made accuracy in all details an important feature of my intermediate language. This language is called Number Language and consists entirely of groups of ten-digit units or NLunits. Most NLunits contain Number Language numbers or NLnumbers which have dictionary meanings such as man, book, office and so on. Each has to be defined accurately in all spoken languages using the system.

A word with two different meanings in English or in any other language must have two different NLnumbers to represent it in Number Language.

Other NLunits provide information about the nature and length of sentences, or indicate which of the NLunits represent the verb, the subject, the object of the sentence and so on. Thus a Number Language message can be translated accurately by computer into any spoken language for which efficient programs have been written for the purpose.

The dictionary is a very important element in the system. Apart from the fact that many words in any spoken language have a variety of different meanings, there is the problem that many words in spoken languages do not have exact equivalents in other languages.

This is why the Number Language version has to be the official version and why every NLnumber has to be defined in every spoken language. This means that sometimes an NLnumber can be expressed in one word in some spoken languages, but requires several words in others.

The creation of the dictionary is a very lengthy task and it is proposed to undertake it in stages, each of which will be clearly defined and numbered. The dictionary for business correspondence will be one of the early stages and will probably consist of between one and two thousand words.

The limitation of the vocabulary for any particular purpose reduces the scope for ambiguities and is very valuable. It also has the advantage that if users can identify which stage of vocabulary they and their correspondents are using, they can limit the storage necessary for the dictionary.

This does not, however, mean that rigid restriction of vocabulary must be practised in all circumstances. If on occasion additional words are necessary, a list of these can be appended to the message.

The writing of programs, too, is a lengthy task and it is also graded. In this case, according to difficulty.

This feature is particularly valuable for researchers. It enables them to know what stage they have reached compared with other users and researchers, and makes possible the exchange of messages in Number Language with other users at the same stage in other countries.

At all levels, accurate translations are obtained. Thus at a very early period, researchers can exchange simple messages in simple language with users

in other countries through computer translation. Not only does this give access to the research, but it also enables them to test simple programs in real life conditions before embarking on more complex ones.

So much for the important differences between my system and that of other researchers. Any reader who has followed so far will want to know why success I have had in my earliest programs. I used British, French, German, Italian and Norwegian languages as obtained accurate translations of simple sentences in all of them. The programs are longer in existence, partly because I used a new object programming language, partly because I have not introduced different programming techniques.

I have now produced a package which translates simple

All that is needed is more work on research, none of which is particularly difficult, but all of it very interesting.

English sentences into German. It is intended for the use of researchers who want to use the system. The programs only they also provide detailed explanations of all the programming methods. The programming language used is a very elementary subset of Cobol, which is easily learnt and is readily adaptable to a computer which uses Cobol.

I should be pleased to supply anyone interested a copy of my unpublished paper "I have written which provides a description of the system and details of the package associated with it."

I hope to continue my researches during my retirement and this of course depends on how much I obtain free computer time. I also hope to persuade others to take up the research both in England and in other countries. It will then be possible to begin computer translation of business correspondence with this method.

Judging by the interest shown in the regular puzzle page of Computer Weekly, plenty of computer people seem to be willing to handle puzzles. I have a variety of subjects, including mathematics, chess and playing cards. Many others are interested in computer art.

So far, I have never seen any references to computer translation problems, which is a pity. I am sure that many people will be sufficiently interested to take up the research, and that language translation problems will, in due course, be featured regularly in the computer press.

On the question of computer translation, I feel that the system is flexible enough to handle complex statements, and that it is not necessary to include any artificial intelligence programs. I cannot, however, say that it is not necessary to include any artificial intelligence programs.

A project team has been formed from the best field diagnosticians in the company who will set the required standards and the work initially with product development staff to identify system characteristics

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Total system engineers the new elite

By G. E. Allen

THE recruitment and training of computer service engineers has taken on a new significance during the past few years as computer technology has been extended to simplify communications between man and machine and produce systems which can be used simultaneously by many people for diverse applications.

For the structure of the systems designed to meet these objectives is, in many ways, more complex than that of their predecessors and this necessitates changes in training to provide different skills.

The role of hardware and software in today's computer is not as clear-cut as it was in the early days and some functions previously controlled by one technique are now controlled by the other, or by a mixture of the two.

Additionally, due to miniaturisation of components and the use of micro-integrated circuit technology, it is possible to pack a very large number of circuits, and thus, computer functions, into a single printed circuit board or unit.

Consequently, the days have gone when a hardware failure could be diagnosed by an engineer putting a test routine on to the central processor and by "stepping-through" to the failed unit.

Instead, error management and recording facilities are incorporated in the system software and the approach to the majority of failures is via software operating systems, using comprehensive suites of test and diagnostic programmes.

Thus the engineers engaged on resolving faults of this nature require a knowledge of the total system - not just its hardware components.

ICL's customer engineering division has recognised the need for service engineers with a good understanding of the total computer system and the division's recruitment, training and career progression programmes are structured to meet this requirement.

In particular, ICL has recently set up a training and development scheme to produce engineers capable of diagnosing faults via the advanced operating systems employed on large 2800 machines.

A project team has been formed from the best field diagnosticians in the company who will set the required standards and the work initially with product development staff to identify system characteristics

which affect maintenance and serviceability. Lecturers from the division's training centre have been assigned to the team to assess training requirements at first hand.

Current implementation of the development programmes will ensure, in the future, much wider training on system architecture, software, hardware, micro-coding and operating systems.

The result will be a highly-trained and mobile group of system service engineers who will be capable of diagnosing complex system faults through the use of the customer's

Training plays an important role in the career progression of all ICL customer service engineers, of whom there are now more than 6,000 worldwide. Hara C. E. Allen, manager, Customer Engineering Division Training at ICL, describes the company's training scheme, and says that, by dedication and hard work, junior entrants can become the total system engineers of tomorrow, and join the new elite of the computer servicing industry.

operating software. Training plays an important role in the career progression of all ICL customer service engineers who now number more than 6,000 worldwide.

Although some courses are designed so that they can be undertaken by engineers while working in their own region, most of the training is provided at the division's extensive training centre at Letchworth which employs more than 80 lecturers and 30 development staff and operates on a budget of £2 million a year.

Because of recent expansion in ICL's overseas operations, around 30% of those attending courses at Letchworth now come from abroad. Additionally, lecturers are travelling overseas to give courses to service engineers in their own countries.

More than 20,000 student weeks of training is provided annually. Over 40% of this is devoted to ongoing training for existing service engineers according to their skills and ambitions, one-third of it covers training in new systems, new products and modifications to existing ones and changes in maintenance technology, and one-quarter relates to the training of new entrants.

The continuation training for existing engineers is designed to enable them to gain proficiency on a greater number of computer systems, to progress to the more complex parts of the computer system where sophisticated test equipment and fault-diag-

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Contact: Margaret Stevens

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TRIAD continues to expand. Our London operation has been growing larger. We are now starting our first out-of-London operation in Guildford which will be managed by Dr. Keith McKenzie. We are therefore looking for high quality people to form a nucleus for this group. We also require more people to be based in our London office.

We have already made our name in minicomputer systems. We are also building up a solid business in microprocessor systems - hardware and software - primarily in industrial automation. Our European involvement is growing profitably. Less headline catching is our continuing work in commercial systems, mainframe program development, hardware selection and high level consultancy.

GUILDFORD

Early project work will include:

- database development
- text handling
- linguistic programming
- control and application software for mini and microcomputers

THE COMPANY

Continuing requirements include:

- commercial systems designers up to £6,500
- experienced project leaders up to £6,500
- competent programmers willing to exploit their talents in a structured environment up to £4,500
- specialist consultants in appropriate areas up to £7,000

THE BENEFITS

What we are offering is:

- challenging work
- relevant training
- early responsibility
- bonus
- travel loans

Write, or ring: Erwin Schneider

TRIAD Computing Systems Limited, 1 Dorset Buildings, Salisbury Square, London EC4Y 8ES. 01-353 6323

Associated Operations in Belgium, France, Germany, Italy and Switzerland

CITY OF DERBY**Principal
Computer Assistant**

Grade P.O. 1(3) £5,512-£8,097
including £520 salary supplement

The successful candidate will be required to control and develop the systems and programming function in respect of new and existing applications from identifying users' requirements to successful implementation and maintenance. The duties include preparation of reports for Management Team and will involve deputising for the computer manager in his absence.

Wide systems and programming experience is required, preferably on ICL machines and in local government, together with a relevant professional qualification.

The Council operates a 40k ICL 1902S installation running extensive real-time local and remote V.O.U. based systems.

Generous resettlement expenses will be paid in appropriate cases.

Application forms and further details may be obtained from the City Treasurer, Council House, Corporation Street, Derby DE1 2FE. (Derby 31111, ext. 819 or 929). Closing date Friday, 9th September, 1977.

Ashford Borough Council**Systems
Analyst/Programmer**

required in a unit operating an ICL 2903 with discs and tapes on behalf of Ashford Borough Council and Shepway District Council.

A minimum of 18 months' practical experience in COBOL is essential with a knowledge of PLAN an additional advantage. Systems training will be provided if necessary.

Salary £3825 to £4095 plus supplements of £312 plus 5%.

- 100% removal expenses
- settling-in allowance
- council accommodation or assistance with professional fees for house purchase in appropriate cases.

Application form and job description obtainable from the Chief Personnel Officer, 14/18 Church Road, Ashford, Kent, tel. no. Ashford 24411, ext. 244, returnable by 19th September, 1977.

Chief Programmer

**New Applications
New IBM 370/158 Installation**

Our client, an extensive user of IBM hardware and software, wishes to recruit an experienced CP programming professional to be responsible for providing depth technical expertise, effort and advice in the development and implementation of wide ranging system utilizing advanced techniques and methodologies. This is a new appointment reporting to the Manager, Technical Support and Advanced Systems.

The successful applicant will need to have technical design thinking on a broad application level, with the ability to advise on the benefits, implications and merits or otherwise of the introduction of relevant technical concepts and procedures.

You are probably around 30 years of age, possess a sound background of experience in applications software design, development and implementation in an IBM 370, 158, 159, 168, 169, 178, 198, 208, 228, 238, 248, 258, 268, 278, 288, 298, 308, 318, 328, 338, 348, 358, 368, 378, 388, 398, 408, 418, 428, 438, 448, 458, 468, 478, 488, 498, 508, 518, 528, 538, 548, 558, 568, 578, 588, 598, 608, 618, 628, 638, 648, 658, 668, 678, 688, 698, 708, 718, 728, 738, 748, 758, 768, 778, 788, 798, 808, 818, 828, 838, 848, 858, 868, 878, 888, 898, 908, 918, 928, 938, 948, 958, 968, 978, 988, 998, 1008, 1018, 1028, 1038, 1048, 1058, 1068, 1078, 1088, 1098, 1108, 1118, 1128, 1138, 1148, 1158, 1168, 1178, 1188, 1198, 1208, 1218, 1228, 1238, 1248, 1258, 1268, 1278, 1288, 1298, 1308, 1318, 1328, 1338, 1348, 1358, 1368, 1378, 1388, 1398, 1408, 1418, 1428, 1438, 1448, 1458, 1468, 1478, 1488, 1498, 1508, 1518, 1528, 1538, 1548, 1558, 1568, 1578, 1588, 1598, 1608, 1618, 1628, 1638, 1648, 1658, 1668, 1678, 1688, 1698, 1708, 1718, 1728, 1738, 1748, 1758, 1768, 1778, 1788, 1798, 1808, 1818, 1828, 1838, 1848, 1858, 1868, 1878, 1888, 1898, 1908, 1918, 1928, 1938, 1948, 1958, 1968, 1978, 1988, 1998, 2008, 2018, 2028, 2038, 2048, 2058, 2068, 2078, 2088, 2098, 2108, 2118, 2128, 2138, 2148, 2158, 2168, 2178, 2188, 2198, 2208, 2218, 2228, 2238, 2248, 2258, 2268, 2278, 2288, 2298, 2308, 2318, 2328, 2338, 2348, 2358, 2368, 2378, 2388, 2398, 2408, 2418, 2428, 2438, 2448, 2458, 2468, 2478, 2488, 2498, 2508, 2518, 2528, 2538, 2548, 2558, 2568, 2578, 2588, 2598, 2608, 2618, 2628, 2638, 2648, 2658, 2668, 2678, 2688, 2698, 2708, 2718, 2728, 2738, 2748, 2758, 2768, 2778, 2788, 2798, 2808, 2818, 2828, 2838, 2848, 2858, 2868, 2878, 2888, 2898, 2908, 2918, 2928, 2938, 2948, 2958, 2968, 2978, 2988, 2998, 3008, 3018, 3028, 3038, 3048, 3058, 3068, 3078, 3088, 3098, 3108, 3118, 3128, 3138, 3148, 3158, 3168, 3178, 3188, 3198, 3208, 3218, 3228, 3238, 3248, 3258, 3268, 3278, 3288, 3298, 3308, 3318, 3328, 3338, 3348, 3358, 3368, 3378, 3388, 3398, 3408, 3418, 3428, 3438, 3448, 3458, 3468, 3478, 3488, 3498, 3508, 3518, 3528, 3538, 3548, 3558, 3568, 3578, 3588, 3598, 3608, 3618, 3628, 3638, 3648, 3658, 3668, 3678, 3688, 3698, 3708, 3718, 3728, 3738, 3748, 3758, 3768, 3778, 3788, 3798, 3808, 3818, 3828, 3838, 3848, 3858, 3868, 3878, 3888, 3898, 3908, 3918, 3928, 3938, 3948, 3958, 3968, 3978, 3988, 3998, 4008, 4018, 4028, 4038, 4048, 4058, 4068, 4078, 4088, 4098, 4108, 4118, 4128, 4138, 4148, 4158, 4168, 4178, 4188, 4198, 4208, 4218, 4228, 4238, 4248, 4258, 4268, 4278, 4288, 4298, 4308, 4318, 4328, 4338, 4348, 4358, 4368, 4378, 4388, 4398, 4408, 4418, 4428, 4438, 4448, 4458, 4468, 4478, 4488, 4498, 4508, 4518, 4528, 4538, 4548, 4558, 4568, 4578, 4588, 4598, 4608, 4618, 4628, 4638, 4648, 4658, 4668, 4678, 4688, 4698, 4708, 4718, 4728, 4738, 4748, 4758, 4768, 4778, 4788, 4798, 4808, 4818, 4828, 4838, 4848, 4858, 4868, 4878, 4888, 4898, 4908, 4918, 4928, 4938, 4948, 4958, 4968, 4978, 4988, 4998, 5008, 5018, 5028, 5038, 5048, 5058, 5068, 5078, 5088, 5098, 5108, 5118, 5128, 5138, 5148, 5158, 5168, 5178, 5188, 5198, 5208, 5218, 5228, 5238, 5248, 5258, 5268, 5278, 5288, 5298, 5308, 5318, 5328, 5338, 5348, 5358, 5368, 5378, 5388, 5398, 5408, 5418, 5428, 5438, 5448, 5458, 5468, 5478, 5488, 5498, 5508, 5518, 5528, 5538, 5548, 5558, 5568, 5578, 5588, 5598, 5608, 5618, 5628, 5638, 5648, 5658, 5668, 5678, 5688, 5698, 5708, 5718, 5728, 5738, 5748, 5758, 5768, 5778, 5788, 5798, 5808, 5818, 5828, 5838, 5848, 5858, 5868, 5878, 5888, 5898, 5908, 5918, 5928, 5938, 5948, 5958, 5968, 5978, 5988, 5998, 6008, 6018, 6028, 6038, 6048, 6058, 6068, 6078, 6088, 6098, 6108, 6118, 6128, 6138, 6148, 6158, 6168, 6178, 6188, 6198, 6208, 6218, 6228, 6238, 6248, 6258, 6268, 6278, 6288, 6298, 6308, 6318, 6328, 6338, 6348, 6358, 6368, 6378, 6388, 6398, 6408, 6418, 6428, 6438, 6448, 6458, 6468, 6478, 6488, 6498, 6508, 6518, 6528, 6538, 6548, 6558, 6568, 6578, 6588, 6598, 6608, 6618, 6628, 6638, 6648, 6658, 6668, 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12858, 12868, 12878, 12888, 12898, 12908, 12918, 12928, 12938, 12948, 12958, 12968, 12978, 12988, 12998, 13008, 13018, 13028, 13038, 13048, 13058, 13068, 13078, 13088, 13098, 13108, 13118, 13128, 13138, 13148, 13158, 13168, 13178, 13188, 13198, 13208, 13218, 13228, 13238, 132

"EXCITING SYSTEMS OPPORTUNITY" SOUTH MIDLANDS SYSTEMS ANALYST SALARY CIRCA £3,850 P.A.

A National Manufacturing concern is presently involved in the implementation of a recognised package to standardise payroll procedures. They are currently undertaking some of the most sophisticated systems development within the UK utilising both large IBM 370 series mainframes and mini hardware.

Our client is seeking a Systems Analyst to work within the Central Payroll Section which is the focus for other Payroll Sections within the UK, providing a source of expertise and control in the process of standardisation, centralisation and maintenance of payroll systems.

Interested applicants should have:- ESSENTIALLY

- * at least three years' systems analysis experience, some of this time to have been spent ideally on payroll applications
- * a degree of equivalent qualification
- * a proven record of success in handling projects from feasibility through to implementation within a large organisation.

PREFERABLY

- * a detailed knowledge of UNIPAY
- * a programming knowledge (ASSEMBLER).

This is an excellent opportunity for a Systems Analyst to become involved in a position of interest and responsibility within the areas of payroll and payroll related systems.

Excellent fringe benefits are what you would expect from a large major manufacturing concern and include a recently updated pension scheme, and facilities for car purchase at extremely advantageous terms.

CONTACT REG HEATH ON: 021-238 3781

REF. NO. 77/08/4

REAL-TIME DEVELOPMENT WEST LONDON ANALYST/PROGRAMMERS & PROGRAMMERS SALARY TO £5,500 P.A.

Our client is shortly to install recently released current generation hardware to service, through this central location, its UK operating companies.

There is a substantial development work-load to incorporate the use of on-line facilities and these positions will appeal to those persons wishing to play a key role in a small developing installation in a newly formed team of Data Processing Professionals.

You must have:-

- * good COBOL experience
- * commercial systems understanding
- * Analyst/Programmers will enjoy a balanced systems/Programming job content.

All these positions carry annual bonus, profit-sharing and other useful benefits.

CONTACT LONDON OFFICE: 01-935 0671

REF. NO. 77/8/5

SCR

BEDFORDSHIRE REAL TIME SYSTEMS SALARIES TO £5,400

Our Bedfordshire based client serves a group of companies. They have centralised their computing activities around a large IBM 370 series mainframe using CICS teleprocessing for real-time development.

This has created capacity for further extending its data processing work. They therefore need to recruit additional key systems analysts who will be involved in major projects. These include on-line booking system, stock control/movement and comprehensive accounting systems.

Candidates should have:-

- * An analytical approach to problem solving.
- * Preferably some experience of systems design, having worked in an Analyst/Programming role.
- * The ability to communicate effectively with all levels of management.
- * A commitment to data processing, a real desire to move into systems analysis and be involved in the business.

There are excellent promotional opportunities to advance to senior systems positions, with salaries in excess of £5,400 p.a.

The company offers FLEXITIME, EXCELLENT WORKING CONDITIONS, FREE LIFE ASSURANCE and RELOCATION ASSISTANCE.

Make a move in the right direction and contact:

ROD BEESON

On 021-238 3781

REF. 77/08/6

SPECIALIST COMPUTER RECRUITMENT LTD.

BIRMINGHAM 021-236 3781 FREEPOST

Freeport, Equity and Law House, 35-37 Great Charles Street Queensway, Birmingham B3 2BR

MANCHESTER 061-833 0676 FREEPOST

Freeport, Corn Exchange Buildings, Corporation Street, Manchester M4 8BD

LONDON 01-935 0671 FREEPOST 6

Freeport 6, 102, Blandford Street, London W1E 1JZ

SCOTLAND & MANCHESTER SALES EXECUTIVES

Base salary c6k
Quota earnings 12k
+ Company car

Our Client is an International Company with a large, well-established customer base in the North of England and in Scotland. The product range covers key-to-disk, shared logic word processing, and distributive processing systems. The products are noted for their technical excellence, and have been well accepted.

The Company is launching a fresh sales effort in the ascribed areas, and requires two mature, experienced sales professionals to develop its existing customer base, and to promote new business sales.

Candidates must have:

- * good sales experience and attendant success in the areas of at least one of the following: key-to-disk, shared logic word processing, distributive computer systems
- * a high level of technical self-sufficiency
- * a current real understanding of the geographic markets defined.

These are unique opportunities for high earnings in a situation with enormous scope for a sales professional who wishes to join a Company on a major re-launch programme.

CONTACT:

DAVID WADE on:
021-236 3781

REF. 77/08/4



Computing
Services
Association

Computer Operator

£2,724-£3,450 + Shift Allowance
and appropriate supplement under
Phase 2 of the Government's Pay Policy

The London Borough of Merton requires an additional operator for its computer installation at the Town Hall, SW19 (adjacent to Wimbledon Station).

The configuration comprises a 94K, 1902T with communications. A shift system is in operation spanning the period 0700-2200 hours Monday to Friday with occasional overtime including weekends. Shift arrangements are subject to review. The successful applicant will be appointed within the salary stated according to experience.

Legal and removal expenses in appropriate cases, loans for annual season ticket and generous holiday entitlement.

Application forms from Borough Treasurer, Town Hall, Wimbledon, SW19. Tel. 01-849 9070, Ext. 329.

CLOSING DATE: 19th September.

SYSTEMS ANALYSTS to £8,000

An established firm of management consultants, members of the Management Consultants Association, needs additional computer people with a good commercial systems background.

Assignments are varied and interesting and cover a wide range of industries and applications. There is the opportunity to travel, to develop skills and experience and to work with consultants of varying disciplines.

Candidates should have a degree or comparable professional qualification and be aged 28-35. In addition to a good salary and range of other benefits the positions offer an excellent opportunity for career development.

Please apply Box No. 1885, Computer Weekly

COUNTY OF CLEVELAND COMPUTER SERVICES UNIT DEPUTY COMPUTER OPERATIONS MANAGER

£6,209-£8,612 (includes supplements)
A Deputy Computer Operations Manager is required for the County Computer Services Unit. This is a very responsible post, having management responsibilities for a considerable number of staff. The central computer is on IBM 370/145 which is connected to a large terminals network for batch and direct enquiry operations.

Applicants must have experience appropriate to the job. Application forms may be obtained from the Director of Computer Services, Reed House, Corporation Road, Middlesbrough, Cleveland, to whom they should be returned by 18th September, 1977.

SENIOR SYSTEMS ANALYST BOURNEMOUTH AREA

An exciting opportunity has arisen for an experienced computer professional to play a leading role in the development and implementation of a range of data processing systems to aid the automation of our company's internal business processes.

Membrain is a young, rapidly developing company, engaged in the design and manufacture of highly sophisticated Automatic Test Equipment for use within the electronics industry.

This is a challenging opportunity offering considerable scope for career advancement. Education: probably to degree standard or equivalent. Several years systems experience in a manufacturing industry is also essential, preferably involving production of material control. Additionally, some O&M experience would be an advantage.

Our long-term objective is the development of an integrated system

covering the company's major business procedures, based on an in-house mini-computer. Direct experience in this area would therefore be a further advantage.

In addition to a highly competitive salary, we offer a number of company benefits. Relocation costs will be reimbursed where appropriate, to assist you in moving to this attractive area, close to the amenities to Bournemouth. Why not telephone Donald Crawford now, on Farndown (0202) 893536. Or write him a brief note requesting further information and application form.

Membrain Limited
Farndown Industrial Estate
Wimborne, Dorset BH21 7PE



Systems Programmer

With the recent installation of our new Honeywell 62/40 we are looking towards strengthening our well established data processing team.

Candidates should have had at least two years experience with a disc based computer system.

An attractive salary will be offered plus all the benefits associated with a major international company. For further details please contact Mr. R. G. Meritt, Data Processing Manager, AEG Telefunken (UK) Ltd, Bath Road, Slough, Berks Tel: Slough 872622.

AEG-TELEFUNKEN (UK) LTD

Eden Limited, manufacturers of Yale For LA Trucks, have the following vacancies

Senior Systems Analyst

£5,000 INCL COLA AND
THRESHOLD

Good commercial background, able to liaise with top management. Will be heavily involved in the modification or re-design of current systems, due to a scheduled change of hardware which will necessitate changes to systems philosophy. Current configuration system 3 on line to IBM 370/151. Manual configuration IBM 3700 on line to IBM 370/151.

Senior Programmer

£4,600 INCL COLA AND
THRESHOLD

3 years' total essential. Knowledge of JCL and microprocessing using IBM 370 would be of advantage. Will be based in the division programming for 370 at the computer centre and the system 3 in the division. The latter to be replaced by an IBM 370.

Data Processing and Controls Supervisor

£3,600 INCL COLA AND
THRESHOLD

To be responsible for data preparation department and computer department. Will be required to sign with users and maintain standards of operating and data entry. Experience essential.

Please write or telephone for application forms to:
Personnel Manager, Eden Limited, Materials Handling Division, Waddens Brook Lane, Wednesfield, Wolverhampton WV11 35W.
Telephone: Willenhall (0902) 99955

EATON Materials
Handling

SHIFT SUPERVISOR

c £4600 p.a.
IBM OS JCL
London

Phone 01-439 6381
(24 hours)
EFFECTIA GRAVIS
Personnel Consultants

MINICOMPUTER PROFESSIONALS

West London £5,000

Our client needs a person capable of taking charge of a minicomputer to be installed early next year.

With the backing of group specialists and a software house you would need to be able to:

- Assist in installation planning
- Set up files
- Set up procedures and controls
- Supervise routine operation
- Train hands-on VDU users

You would also be expected to spend a couple of months learning about warehousing and distribution. If you can tackle this challenging and responsible job it could be your career take-off point.

Send career details to David Torvall at our London office, quoting reference DT/348.

Ivor Norton Management Services Ltd

P.O. Box 83, Copthall Tower House, Harrogate, HG1 1TS.
Tel: Harrogate 66626
95/87 Jermyn Street, London, SW1Y 6JD.
Tel: 01-930 6881

Distributed Processing Development £4,000-£7,500 p.a. + mortgage subsidy

The London development centre and Bristol computer installation of



Schroder Computer Services Limited

are now well established, with the IBM 370/148 computer, one of the first in the UK, fully operational.

The machine works under VM with CMS, to provide distributed processing facilities to group and external clients via a variety of terminals, with on-line program development for the London centre.

The considerable expansion has created opportunities in the customer services and development departments for further people with relevant DP experience:-

Consultants — 1 each London and Bristol

Up to £7,500

The posts embrace the important roles of client liaison, marketing support, project auditing and management/systems consultancy. Applicants must be able to demonstrate significant success in a similar function.

Systems Analysts — London

Up to £6,500

A number of opportunities have been created up to Senior level within the development group on a wide variety of applications, with emphasis on commercial, investment and stockbroking systems. A proven background in programming and analysis is required and IBM involvement desirable.

Analyst/Programmer — Customer Support — London

Up to £5,500

The company expansion has created the need for a person to support commercial systems and liaise between clients, sales and technical departments — a varied and interesting job to suit the person who has a sound understanding of overall programming and systems concepts.

Programmers — London

£4,000-£5,500

There is a wide variety of projects for programmers and we would like to discuss the opportunities with you if you have 1-4 years' practical experience, which must include IBM ASSEMBLER, with COBOL knowledge useful.

These positions represent excellent opportunities with a sound and reputable group, having a high regard for employee welfare, offering generous benefits, including 60p LVs, season ticket loans, flexible mortgage subsidy and excellent non-contributory pension scheme.

The opportunities are exceptional and you should telephone our CROYDON Office to discuss them in more detail, please quote ref. CW54-78.

01-688 8883 (24-HOUR ANSWERPHONE)
19 PARKER STREET, CROYDON, CR9 1TN

061-236 2418 FAULKNER HOUSE
FAULKNER STREET, MANCHESTER, M1 4YD

COMPUTER AND
PROFESSIONAL
PERSONNEL
CONSULTANTS



CAPP ASSOCIATES
LONDON AND MANCHESTER

Computing
Services
Association

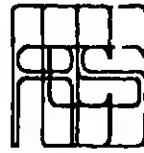
Senior Systems Analyst
Salary £6,000-£8,000 p.a.
Applications are invited for the above post within the County of Cleveland. The successful candidate will be responsible for the design, development and implementation of systems and will be required to liaise with users and management. The post is a full-time position and the successful candidate will be required to work on a shift basis. For further details and to obtain an application form, please contact Mr. R. G. Meritt, Data Processing Manager, AEG Telefunken (UK) Ltd, Bath Road, Slough, Berks. Tel: Slough 872622.

Freelance
Experienced
PLAN
Programmer
£185 per week
We have a number of freelance opportunities available for experienced PLAN programmers. The work is varied and interesting and offers a good opportunity for those who are looking for a change of scene. For further details and to obtain an application form, please contact Mr. R. G. Meritt, Data Processing Manager, AEG Telefunken (UK) Ltd, Bath Road, Slough, Berks. Tel: Slough 872622.

COMPUTER CENTRE USER DOCUMENTATION
We are seeking experienced user documentation writers to join our team. The successful candidate will be responsible for the design, development and implementation of user documentation for a variety of computer systems. The post is a full-time position and the successful candidate will be required to work on a shift basis. For further details and to obtain an application form, please contact Mr. R. G. Meritt, Data Processing Manager, AEG Telefunken (UK) Ltd, Bath Road, Slough, Berks. Tel: Slough 872622.

ANGLIAN COMPUTER SERVICES

SPECIAL ANNOUNCEMENT



With immediate effect Anglian Computer Services becomes:

ANGLIAN D.P. SERVICES LTD.

Due to expansion, we have found it necessary to change our company name and relocate to larger offices.

We have many vacancies for computer staff on our books. We are particularly looking for people with ASSEMBLER and COBOL experience to work in Norfolk or Suffolk.

For further details ring Steve Tumbridge on Danbury 4255 (STD 024 541).

Our new address and telephone number is:

ANGLIAN D.P. SERVICES LTD.
Stratford House, Maldon Road
Danbury, Chelmsford CM3 4QW
Tel: Danbury 4255 (STD 024 541)

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For a new project team exploiting Europe's foremost Communication Equipment.
£4,000-£14,000

Based London/Europe

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8 Oxford Street, Nottingham.
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The Personnel Officer
HAWKER SIDDELEY AVIATION LIMITED
Richmond Road, Kingston-upon-Thames,
Surrey KT2 5DS
Telephone: 01-546 7741
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Liverpool

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Ext 640



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TEL: HALIFAX (0422) 58232 (10 LINES)

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Candidates should have gained a minimum of four years' experience using COBOL in a commercial environment. We demand a high degree of technical competence and professionalism from our Technical Staff. In return we offer an opportunity to make a real contribution, and to grow within a dynamic and stimulating environment where talent and initiative are both recognised and rewarded.

In addition we offer competitive salaries, a comprehensive benefit package and an air fare to Canada for successful applicants and immediate dependents.

Preliminary interviews will be held in London throughout September. Applicants are invited to forward complete resumes in strict confidence to:

Dept. 131, Government of Ontario,
Selective Placement Services,
Ontario House, 13 Charles II Street, London SW1Y 4QS.

1900 Operator Training Opportunities

£3300-£4600 Windsor

Are you an experienced 1900 Operator? Have you ever considered progressing out of operating to use your knowledge and experience in training others?

We would like to hear from you if you have:-

- the ability to communicate clearly
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- knowledge of GEORGE 2 or 3
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The job involves lecturing to experienced Operators on a range of courses including advanced 1900

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You will be based at our training centre in Old Windsor, Berkshire. Your initial training will include teaching techniques, followed by attending the courses you will be expected to teach. The starting salary is negotiable depending on previous experience.

Please contact Mary Ann Bingham, Assistant Personnel Officer, ICL, Beaumont, Old Windsor, Berkshire, SL4 2JP. Telephone Windsor 6611. Please quote reference CW1506.

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— the Group's success and its high reputation has been gained from the production of high quality software in the commercial and development software areas of both clients and the major European computer manufacturers and micro-processor companies.

We need

— software specialists to work within application groups on small business interactive systems.

— specialists to work on micro-processor projects for new hardware prototypes.

— responsible personnel capable of working without detailed supervision.

You need

— minimum of four years' proven programming experience in assembler languages, BASIC or PL-1 on small business systems, mini-computers or micro-processors.

— to be self-motivated and have worked on computers in a commercial environment.

— to have worked on micro-processors, software development for a manufacturer, or data transmission experience would be an advantage.

Applications, including c.v. in writing to:

Mrs. B. Alken
Holland Automation International (UK) Limited
457a & 459 Bath Road
Clipperton, SLOUGH SL1 6AA, Berks.

or telephone for Application Form—Burnham (062 86) 65232/3.

Our method

— all employees are shareholders.

— all shareholders are employees.

— only method of operating a successful software house is with enthusiastic highly motivated staff who are given responsibility and a high degree of involvement in the Company.

— provision of a strong bond between employees and the Company.

We offer

— work on variety of projects on latest up to date interactive systems and micro-processors.

— good working environment with enthusiastic motivated personnel aiming to produce good quality software.

— good competitive salary up to £6,500 dependent upon experience plus bonus participation based upon performance.

— full shareholding option and participation in company profits.

— car or car allowance.

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We do not

— offer working on large scale projects as part of a big team with little feeling of involvement.

— guarantee an unemotional feeling towards the Company.

— want staff who consider themselves more important than the Company or the customer.

— need consultants by name and not by proven deed.

— require staff who cannot work without detailed supervision or lack basic commercial knowledge.



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We have outstanding opportunities for Fortran Programmers, with a background in any of the following:

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Our clients include well-known Software houses, manufacturers and international engineering organisations.

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6-15 months experience?

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With that kind of experience under your belt, it's hardly a good idea to chop and change jobs. But it's more than likely that you could be doing a lot better than you're doing now. Datascene can get you that better job. And we like to think that once we've found it for you, you'll stay. So we don't look forward to seeing you again — for a long, long time. We've got vacancies on IBM, ICL, HONEYWELL and UNIVAC plus a few on machines you've probably never heard of. Using disciplines and languages that you're either familiar with or are unknown. Earnings? Around £2750-£4100, depending on what you know. Or what you can learn. We're offering you more than a job. We're offering you a career.

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£3000-£7750
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If you are a Mini Programmer and have been involved with technical or commercial applications and have experience in any of the following, we want to hear from you.

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IBM DOS/VS	ESSEX	18 Mths	£3600
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IBM OS	CITY	18 Mths	£3800
ICL GII	QTY	18 Mths	£4000
ICL GII	N. LONDON	18 Mths	£3600
ICL GII	W. LONDON	18 Mths	£4200

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Plus Staff Mortgage!

If you have proven on-line experience on IBM/ICL with COBOL or PL1, our client needs you now!

They are a financial institution who are currently developing a real-time system using the latest generation of intelligent terminals.

So, for big company benefits, unlimited career prospects and a mortgage that is nearly painless, ring TODAY.

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Initials include IBM System 3, 370 and Model 32, ICL 2803, Honeywell, Burroughs and many, many more.

Clients are just as varied, including Banks, Insurance, Retail and Consultancies. Listed below are just some of our vacancies. If you find one that suits you, or even if you don't, we want to hear from you NOW!

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RPG II	Insurance Co.	SVS/10	W. I	£4200
RPG II	Bank	SVS/10	City	£4400-£5000
RPG II	Manufacturing	ICL 2803	W. I	£3800-£3900
RPG II	Financial	ICL 2803	Survey	£3900

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ANALYSTS/PROJECT LEADERS £5,000-£6,500

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At least two years' Systems experience is required to work on project from feasibility study to implementation. Senior positions involve some project control. Qualifications preferred.

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Please phone for application form.

AMES PERSONNEL
TELEPHONE: 01-767 0611

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We need more good field and in-house engineers.

Our sales and support requirements are increasing rapidly and we are looking for people well qualified and versed in computer peripherals with special reference to core memory and memory systems, disc drives and tape drives.

There are both senior and junior positions available and we will be pleased to hear from you if you think you can make the grade.

Applicants should have a good background knowledge of electronics with ability to service down to component level, at least two years of practical experience and the ability to absorb continuing training in the latest techniques. These positions provide excellent career opportunities, salary and company car for the senior engineers.

Please apply to Personnel Manager, Amplex Great Britain Limited, Acree Road, Reading, Berks. Telephone Reading 66200.

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The Management Services Department of TI Tube Division Services provides an internal consulting service to the 20 operating companies of the Steel Tube Division which have a combined turnover exceeding £300m. and manufacture and market a wide range of products.

Due to promotions within the Department, we are now able to offer attractive posts to analysts. These appointments provide the ideal opportunity to gain wide experience of systems — using main frames and minis and employing the latest techniques in data base and data communications — for manufacturing, commercial and other functions.

Ideally candidates should be primarily interested in application rather than computer technology and be sufficiently self motivated and experienced to enable them to work on their own initiative in operating company situations.

Most projects are at companies in the West Midlands and those further afield may occasionally involve an overnight stay.

Applicants should have a working knowledge of industrial information and control systems using computer or D & M techniques gained from 2-3 years practical experience.

The positions are open to man and woman and offer excellent career development prospects in Management Services or in Line Management. Terms of employment are good and include travel and mileage allowance.

Please apply in writing giving full personal details of experience to date to:

Mr. L.E. Faarende, Personnel Manager,
TI Tube Division Services Limited,
TI House, Five Ways, Birmingham B16 8SQ

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Applications are invited from graduates with good honours degrees for the following posts:

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Ref. CL/41/GW

The information services provided to computer users include a wide range of documentation, an advisory service, short courses and instructional software. The successful candidate will be expected to create new material in this field in addition to undertaking several on-going commitments.

COMPUTING OFFICER (SYSTEMS)

Ref. CL/42/GW

The successful candidate will work on a linked PRIME 300 system and should have some experience of multi-computer systems and be interested in communication protocols and network development. Experience of assembly language programming is essential and knowledge of real time working and facilities would be desirable.

Salary on the scale £1333-£6627 per annum. USS/FSU.

Application forms and further particulars may be obtained from the Department, University of Salford, Salford M6 6PU. To whom completed forms should be returned by 18th September, 1977, quoting the appropriate reference number.

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A rapidly expanding U.K. company engaged in Maintenance and technical training projects worldwide require personnel with the following qualifications and experience on our permanent staff overseas:

- IBM 370/158
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Mrs. A. Noin
Technicare International Ltd.
Rose Industrial Estate
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Or Telephone Bourne End 22823

Borough Treasurer's Department

Programmer

AP 2/3 £2600 to £3000 + £312 salary supplement phase 2 supplement

The Council operate an IBM 370/158 with tape and disc. Candidates must be experienced in COBOL.

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Application forms and job descriptions available from Personnel Officer, Town Clerk's Department, Borough Offices, St. James Street, Ayr, Ayrshire, Ayr, Scotland. To whom they should be returned not later than 18th September, 1977.

Convening of Senior Officers Members of the Council will be held on 19th September.

Borough of HYNDEN

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Applicants must be graduates with good honours degrees in Computer Science, Mathematics, Physics, Engineering, or a related subject. They should also have a good knowledge of the English language. The University of Manchester is a leading centre of research in computer science and offers excellent facilities for the study of computer science. The University of Manchester is a leading centre of research in computer science and offers excellent facilities for the study of computer science.

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For mainframe, minicomputer and mixed processor systems, usually supporting terminal networks. Increasingly, Data Logic's turnkey projects involve multiple, separated minicomputers. Applicants must have at least 5 years implementation experience. They must have managed a sizeable project or have taken substantial team responsibility.

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To advise clients on the creation or upgrade of databases and to assist Data Logic teams in the design of retrieval systems. Projects will involve both mainframe and stand-alone minicomputer configurations. Applicants should have experience in the design of record structure and have used at least one of the leading database packages such as ADABAS, IMS, TOTAL and DMS/2. Knowledge of banking or insurance is of particular interest.

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For consultancy and implementation projects, with a bias towards large ICL 2900 models. Applications will include database systems and communications networks. Extensive knowledge is required of hardware capability, operating systems and standard software. The scope for application of this knowledge and for career progression will be considerable.

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For mainframe projects involving a variety of interesting and demanding applications, including banking, insurance, manufacturing and distribution. Applicants should have 3-5 years analysis and programming experience. A sound knowledge of CICS will be an added advantage.

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For work at the forefront of the commercial application of small computers. The majority of projects will involve data communications and several systems now in their early stages include many interconnected processors. Applicants should have at least 3 years design experience, preferably including system sizing and performance assessment.

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Principally for real time minicomputer systems applied to analysis and/or control in scientific environments. There may also be some problem solving in high level language on mainframes. Applicants should have a relevant degree in the mathematical sciences and one or more years practical experience in assembler or FORTRAN.

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For design and development of systems incorporating custom-built devices such as interfaces and terminals, with an emphasis on the use of microprocessors. Applicants should have a degree in electronics or computer science and have programmed mini or micro computers at assembler or microcode level.

DATA LOGIC

Most vacancies exist in London, the Midlands and Manchester. Write or telephone to:

W. D. Barrow
Data Logic Limited
Weatway House
320 Rutland Road East
Greenford, Middlesex UB6 9BH
Tel: 01-578 9111

A. W. Tsyler
Data Logic Limited
Poly Estate
Heraford
Tel: 0432-55211

J. Anderson
Data Logic Limited
Warwickgate House
Warwick Road
Stratford, Manchester
Tel: 061-672 3232



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The people we require will have some experience in assembly level programming and in one or more of the following areas—

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The rewards with NCR, in addition to high job involvement and excellent social amenities, include a negotiable salary, 35 hour week, with the possibility of paid overtime, pension and life insurance schemes, subsidised catering facilities and generous relocation assistance.

In the first instance, please write giving full career and personal details to—

Ian Hume,
Personnel & Employee Relations,
NCR Manufacturing Division,
Kingway West,
DUNDEE DD2 3XX



PROGRAMMERS

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in a growth installation?
If so, use the coupon to tell us.

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Name: _____
Address: _____
Home tel no: _____ Age: _____
Office tel no (will be used for reply): _____
EDUCATIONAL QUALIFICATION: _____
DATA PROCESSING EXPERIENCE: _____
Years programming: _____ Years systems analysis: _____
Languages used: _____
Machines worked on: _____
Present salary: _____ Salary required: _____
Job sought: _____

Send to David Torvell, Ivor Norton Management Services Ltd,
95/97 Jermyn Street, London SW1Y 6JD

Ivor Norton Management Services Ltd

P.O. Box 63, Cophall Tower House, Harrogate, HG1 1TS.
Tel: Harrogate 66628.
85/87 Jermyn Street, London, SW1Y 6JD.
Tel: 01-930 8861.

Software Programmer

Sussex

A forward looking and profitable manufacturing company with a growing commitment to processing now has need of a person to fulfil the Systems Programmer role.

The prime functions are to achieve optimum performance of the operating system and software, liaise with the applications area to assist, educate and produce standards and technical support internally.

The requirement provides the opportunity to work within a small, friendly department in a rural area but with a wide choice of housing, easily accessible to the South Coast. Generous assistance is available where necessary.

It is preferred that applicants have a sound background of ASSEMBLER programming in a shop environment, ideally IBM DOS and/or DOS/VSE but programmers with a minimum of 2 years' experience in the technical area will be considered for training.

Please telephone our CROYDON office for further information. Please quote ref: CW55-78.

01-666 9693 (24 HOUR ANSWERPHONE)
19 PARK STREET, CROYDON, CR9 1TN

061-236 2419 FAULKNER HOUSE
FAULKNER STREET, MANCHESTER, M14 6JL

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CAPP ASSOCIATES
LONDON AND MANCHESTER

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We are embarking on a major development phase to supply computing facilities to newly acquired companies in our group. Areas covered will range from order/invoicing, stock control, etc., to rather more esoteric applications such as structural stress analysis and front load modelling.

Our equipment comprises one of the largest I.B.M. System 3/15D installations in the country, with a strong commitment to developing our 3270 T.P. network. We require a programmer with at least 18 months' experience, who has the ability and the ambition to widen his/her knowledge of computing and business in many diverse areas.

If you think you can play an important and contributory role in our development plans and want to be involved in a major development in its inception, write giving full details to:—
Personnel Manager

**KYLE
STEWART**

Ardsheil House, Empirn Way
Wombly, Middx. HA9 0NA

or telephone: P. Campbell 01-902 5321 ext. 230

UNIVERSITY OF OXFORD Appointment of a Computer Programmer

Applications are invited to fill a vacancy in the Data Processing and Management Services Section of the University Offices for an experienced programmer to join a systems programming team designing and implementing an increasing range of internal and personal record applications in the field of university administration. The computer is an ICL 1901T. Applicants should have at least two years' experience of PLAN and/or COBOL, preferably on an ICL 1900 series machine. A knowledge of FORTRAN would be an added advantage.

Salary will be on the scale at present £2004-£5,627 meeting salary according to qualifications and experience.

Further particulars may be obtained from the Deputy Registrar (Administration), University Offices, Wellington Square, Oxford OX1 2JG, to whom applications should be sent by 15th September, 1977.

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Is sought to work for one year within a small team or the College Computer Centre at Fulham Broadway. The person appointed will have at least two years' operating experience on main-frame computers, preferably CDC or ICL/Elliott, together with minimum qualifications of O-level Mathematics and English. The College computer is an ICL 4180 linked to a PDP 11/40. Term and computer which handles telecommunications. Batch and time-shared interactive computing facilities for up to 19 terminals are handled concurrently. In addition, a separate batch terminal links to the University of London CDC machine. Salary will be within the range £2600-£3063 inclusive of £450 London Allowance and Supplement. A shift allowance of £343 per annum is also paid for two-shift operation.

Applications, giving full details, to Mr. R. F. Shepherd, Computer Centre, Chelsea College, University of London, Fulham Place, S.W.6, Tel. 01-358 7244.

STRATHCLYDE REGIONAL COUNCIL

COMPUTER SERVICES DEPARTMENT SYSTEMS ANALYSTS

Salary Scale: A.P. III £3474-£3828 + supplement of £312 and 5% of salary.
A.P. IV £3957-£4385 + supplement of £312 and £208.

Placing according to qualifications and experience. Location at May House, Anderson Court, Glasgow.

Vacancies exist within Project Teams for analysts to contribute to the design of systems where volume and where performance characteristics are important. The authority is developing major systems for business which will be operated on a telegraphic based on powerful ICL/DC series computers and Mainframes.

The Computer Services Department provides a network of terminal network to the many varied departments within the authority and there is much scope for developing applications employing computer techniques.

FORTRAN PROGRAMMER

Salary Scale: A.P. III £3474-£3828 + supplement of £312 and 5% of annual salary.
A.P. IV £3957-£4385 plus supplement of £312 and £208.

Placing according to qualifications and experience. Location at May House, Anderson Court, Glasgow.

A vacancy exists within the Project Team which is responsible for the design of systems where volume and where performance characteristics are important. The authority is developing major systems for business which will be operated on a telegraphic based on powerful ICL/DC series computers and Mainframes.

This is a small team operating in a very significant growing and challenging work area. It should have previous relevant experience.

Application forms for all the above posts should be obtained from the Assistant Director of Services, 21 Gordon Street, Glasgow G1 1TF, returned by 18th September, 1977.

R. M. O. McCulloch
Director of Services

ANALYST

A leading publisher of Scientific documents in London requires an ANALYST.

The work comprises instructing and supervising computer bureaux in U.K. and U.S.A. and Computer bureaux on questions relating to our customers on questions relating to our customers and our international on-line retrieval service.

The successful applicant will have at least 3 years' systems experience and some programming experience preferably on I.B.M. 360/370 systems, and some on-line experience. Preferred age 25-30. The position carries a salary of up to £5,000 p.a. to experienced. Holidays and pension scheme associated with a progressive expanding company.

Please write with a detailed curriculum vitae to: Personnel Manager, Darwent Publications Ltd, Rochdale House, 128 The Quadrant, London WC1A 4EP.

SENIOR ANALYST/PROGRAMMERS

SOUTHERN ENGLAND CLOSE TO SOUTH COAST

SALARY up to £6500 pa PLUS BONUSES

Do you have a thorough knowledge of RPG 11 and an interest in working on multi-location systems, involving occasional overseas travel?

If so, our client would like to meet you.

As an international organisation, with worldwide marketing interests, they have established computer systems in numerous locations, including Japan, Canada, Australia and most European countries.

All systems development, based on either IBM System 3 or IBM System 32 hardware, is developed/controlled by a central team at their UK Data Centre.

Their prime requirement is for two Senior Analyst/Programmers for the manufacturing systems group.

If you have sound manufacturing/commercial systems and programming experience, have seen at least one major system through to implementation and really enjoy complete involvement in all aspects of systems development, then you would find these positions particularly attractive.

If you can show our client that you have these qualities, then you could be earning a total package worth up to £7000 pa in the very near future. In addition to salary there are discounts on company products and generous relocation expenses.

Please apply to John Goldsmith, quoting Ref. No. 691.

Computing
Services
Association

John Goldsmith (Computer Services) Limited
15 Buckingham Palace Road, London SW1
Tel: 01-828 5355, 24-hour answering service

JOHN GOLDSMITH (Computer Services) Ltd.

2 AREA SALES SUPPORT EXECUTIVES NATIONAL BUREAU SALARY RANGE £4,000-£5,000 + CAR + BONUS

Due to continuing expansion, our Clients, a well established and specialised Computer Bureau, seek two Professionals to augment their existing marketing team. Responsibilities will include: detailed pre-sales work combined with on-going post-sales responsibilities, including: training, implementation and customer liaison. These posts are seen as developing opportunities for senior sales and marketing positions.

Successful candidates should have experience of data processing in a user environment combined with an understanding of modern business needs. Candidates should be confident and well presented, and capable of communicating at both boardroom and shop floor levels. One of the successful candidates will be based in the Manchester area, the other in Southern England; however, travel to user sites within each area is involved.

An excellent salary will be paid, based upon previous experience, and the job also carries a Company car plus an excellent incentives scheme and fringe benefits.

CONTACT: DAVID WADE on:
061-833 0676
or the London Office on:
01-935 0671

REF: 77/09/1

LONDON EUROPEAN TRAINING MANAGER INCOME TO £9,500 + CAR + BENEFITS

Our Client is one of the most successful Computer Services Operations in the World, which sells and supports sophisticated solutions to business and management problems. The Company's network spans Europe and the USA, with products and systems which are amongst the industry's finest. The Company is noted for its sound attitudes to training, and its recognition of the importance of the internal training function. This key appointment arises out of the promotion to a Senior Sales Management level of the present incumbent. It calls for the active participation in the sales and management training of the Company, and the supervision of technical training.

Interested candidates should have:

- * probably a sound sales and sales management background within the computer services or business machine industry — this period should have been spent with an organisation which has recognised professional sales training; for example: NCR, Burroughs, Olivetti, Philips, etc.
- * the ability, not only to deliver our Client's packaged sales and management training, but also to develop future material.
- * a desire to develop a career within a fast-moving international company
- * aged 30/40

CONTACT: PETER RIGBY on:
021-236 3781

REF: 77/09/2

SPECIALIST COMPUTER RECRUITMENT LTD.

BIRMINGHAM 021-236 3781 FREEPOST
Freeport, Equity and Law House, 35-37 Great Charles Street, Birmingham B3 2BR

MANCHESTER 061-833 0676 FREEPOST
Freeport, Corn Exchange Buildings, Corporation Street, Manchester M4 6BD

LONDON 01-935 0671 FREEPOST 6
Freeport 6, 102 Blenheim Street, London W1E 1JZ

MANCHESTER

DATA PROCESSING MANAGER

SALARY NEGOTIABLE

We are retained to recruit a data processing professional for our clients, a public Company specialising in high technology products to the transport industry. The successful candidate will take complete control of a small data processing department utilising Burroughs B700 hardware. Duties will include systems development, programming, tuning and control of operational data preparation.

Our clients require:—

- * a proven track record in systems/programming
- * Burroughs experience (preferred)
- * an understanding of small machine operations
- * good man management skills
- * the ability to communicate fluently and clearly at all levels.

Our clients offer excellent benefits including: an above average pension scheme and relocation expenses by negotiation.

CONTACT: David Wade 061-833 0676. REF: 77/09/3

Computing
Services
Association

QRH

COMPUTER
RECRUITMENT

We are currently seeking the following staff for QRH Software Ltd., a member of the QRH Computer Group. The growth rate over the last 6 months has been approx. 100% and to continue on those lines we urgently require:-

WEST YORKSHIRE
Project leader to £7000 P.a., with manufacturing systems and commercial experience. Must be able to successfully develop and control own team.
Programmer to £4500 COBOL or RPO if knowledge.
Planned progression to systems work.
For our other clients we urgently need:-

YORK
Programmer to £5000 COBOL or Assembly with general systems knowledge. Well known company. Good opportunity for hard worker.
Graduate or HNO to join team to train as programmer. Planned career path in Computer World.

LEEDS
Programmer to £3800 IBM and COBOL experience preferred. Large progressive group with additional equipment being installed this year.
Analyst/Programmer to £4500 COBOL, PLAN or PL1 experience. General commercial experience. Interesting work with opportunity to learn.

BRADFORD
Programmer to £3800 COBOL or PLAN experience. Small team set-up in well-known company.
We also have many other vacancies in the North.

QUEENS ROAD MILLS, HALIFAX
WEST YORKS HX1 4LR
HALIFAX (0422) 58231 (10 lines)

BORDERS REGIONAL
COUNCILCOMPUTER
MANAGER

PO II £5805 to £8408
+ £620 supplements

Applications are invited for the above post from computer professionals with a minimum of five years' experience.

The Council will shortly upgrade its existing IBM 370/115 installation to a 128K capacity. There will be three disk drives and one tape drive, the system running under DOS/VS.

Applicants must be able to demonstrate a proven record of successful records systems implementation and have the ability to control a multi-disciplined team of analysts, programmers and operations staff.

Application forms and further particulars may be obtained from the Head of Personnel and Management Services, Regional Headquarters, Newton St. Boswells TO6 0SA, with whom applications should be lodged not later than 9 September, 1977.

MYRIAD
OPERATIONS
LIMITED

Computer Personnel Consultants

IBM OPERATORS

LONDON

8 months—3 years OPERATING

To £4100+

There is no better way to gain very valuable operating experience than running a variety of commercial and scientific applications whilst employed by a computer service bureau. The pressure of such an active environment demands the utmost from a dynamic highly-competent operator, capable of making decisions, recognising problem areas, and working with a minimum of supervision. Someone who will react further than just loading tapes or changing papers.

You should have a minimum of six months' operating experience, preferably in an IBM OS environment. A progressive career to date is important, but enthusiasm and determination to succeed will add weight to your application. You should also feel ready to accept responsibility.

If you feel confident enough to enter the elite, in a powerful 370 installation, then the rewards are high, and future prospects excellent. This is a rare and important opportunity to join a close-knit team, within a sophisticated computer organisation.

Please telephone for a confidential discussion or write:
30 Fleet Street London EC4Y 1AA
01-353 5868

PROGRAMMERS

MAINFRAME AND MINIS

CMES is a successful (Software) house established in 1970. WE are looking for good programmers who will be based at our St Paul's office or at our clients in London, Home Counties, MIDLANDS & SOUTH COAST so that we can continue our expansion. We would prefer you to have a minimum of 2 years' experience on more than one machine with at least two languages.

Remuneration will be attractive and negotiated in accordance with your experience and ability. Our urgent requirements are:-

370	DOS or OS	PL1 or BAL
370	DOS	COBOL
1900	G111	COBOL
PDP11	RSX or RSTS	BASIC + or MACRO 11

Telephone or write to:

Bob Osborn

21/25 Gold Road, W12 8QQ. 01-743 1114

Use our FREEPOST service if you wish or leave a message during the evening on our Ansaphone.

CMES

PARIS—View of the Champs Elysées at night

Dear Alan,
Met a girl from ITT Harlow last night - sitting at same table in a cafe along the Champs Elysées. Couldn't believe it when she said she was a programmer too! Told me you need more COMPUTER PROGRAMMERS for UK Head Office to work on new systems for Honeywell 66/20 - on real-time basis. Is it true that the salary would be around £5000?

I have nearly 2 years COBOL experience, and am looking for new job in large, expanding company such as ITT Components Group Europe - very impressed with company's track record throughout UK and Europe... would like to see you when I return to discuss opportunities. Will phone you on Harlow (0273) 26811 or write again. Chris

P.S. The lady sends her regards!

Components

ITT

MYRIAD
APPOINTMENTS
LIMITED

Computer Personnel Consultants

SENIOR PROGRAMMING STAFF

MIDDLESEX

Large IBM installation

A major manufacturing and distribution Company to the west of London is seeking senior programming staff to supplement an existing programming team. The Company has recently upgraded their hardware and is currently developing several new systems using the latest IBM software.

A Chief Programmer is required to manage the programming team. A proven track record, capable of scheduling work, meeting deadlines and ability to communicate with senior management is essential.

A Systems Programmer or experienced Assembler Programmer is required to eventually take full responsibility for systems software.

Salary for these positions will present no problems for the successful applicants and the benefits package is commensurate with that expected from a large international Company.

COBOL PROGRAMMERS

New Department

LONDON

£3800-£5500

Excellent opportunities have arisen for Programmers seeking a position within a new team in a professional environment.

The company, part of an international group, is a leader in its field. Successful applicants will be engaged on extensive development work on an on-line commercial project. Training will be given and those appointed will be encouraged to accept increasing responsibility and gain progression towards design and analysis in the future.

Candidates should be able to offer 1-4 years COBOL experience, as appointments will be made on a level appropriate to individual experience.

The company has a range of fringe benefits including four weeks annual holiday and flextime.

SENIOR ANALYST/PROGRAMMER

3 years' experience

c £5600

LONDON

This position offers positive career prospects to a programmer or analyst/programmer seeking a greater challenge, more advanced technical experience and additional responsibility.

Having successfully computerised a number of accounting and management information systems, the Company is now developing a large on-line system to assist with the production and distribution of a wide range of its products. Working within a small specialist team the successful candidate will have the opportunity to broaden his/her experience on this unusual application using the latest techniques and equipment.

Applicants should have around three years' programming experience and be keen to participate in analysis activities involving considerable user contact.

This is a senior position within an expanding organisation where conditions of employment are excellent and accompanied by a range of fringe benefits.

PROGRAMMER

S. E. LONDON

to £5,600

This is an interesting and challenging opportunity for an experienced programmer to join an active department with an enthusiastic approach to computing.

There will be an initial period, during which the person appointed will acquaint themselves with the installation and the company business. After this period they will be encouraged to work on their own initiative often unsupervised. They will become involved in all aspects of systems development and will be largely responsible for the smooth running of current live systems.

Candidates will be able to offer programming experience, preferably using COBOL, coupled with some exposure to basic systems analysis.

Please telephone for a confidential discussion or write to:
30 Fleet Street London EC4Y 1AA
01-353 5868

TELEPROCESSING IN NORWICH

Our client is making major upgrades to their IBM 370 (working under DOS/VS) to undertake additional teleprocessing developments which give exceptional opportunities for project team staff at all levels to combine interesting career prospects and attractive working conditions with the "good life" of Norwich — excellent educational, shopping and cultural amenities, easy access to the unique recreational facilities of the Norfolk Broads, countryside and coast line, plus a wide choice of relatively inexpensive housing.

SYSTEMS ANALYSTS

Must possess the ability to communicate effectively with all levels of management, and have previously implemented at least one major system in a financial environment. Experience of TP systems an added advantage.

PROGRAMMERS

Should have at least two years Assembler background and whilst experience in CICS/VS and OL/1 would be advantageous, training will be available.

In addition to competitive salaries, the excellent company benefits include free lunches, flexible working hours, and assistance with relocation expenses where appropriate.

For immediate action, in complete confidence, ring Bryan Richmond on Norwich (0603) 887233 any day up to 9.00 p.m., or write with brief details of experience and salary to:

EAST ANGLIAN SYSTEMS LIMITED
PO Box 79, Norwich NR1 4EF

Systems Test Engineers

AMDAHL is a leading manufacturer of large scale, high-speed computers. We are establishing our first manufacturing base outside the U.S. in the Dublin area to further our expansion. In our first full year of operation, 1976, our sales revenue was U.S. \$93,000,000.

Amdahl needs an Exceptional Team

As Amdahl's rapid growth continues, we need professional people with experience to fill the following positions.

Systems Test Engineers

Candidates for this position should have 3-5 years experience in hardware final test, logic design, or field support of medium or large scale digital computer systems. IBM 360/370 or compatible systems is preferred. HNC/HND, Degree or equivalent technical training is required.

Lead Systems Test Engineers

Candidates for this position should have 7-10 years experience in hardware final test, logic design, or field support of medium or large scale digital computer systems. IBM 360/370 or compatible systems is preferred. HNC/HND, Degree or equivalent technical training is required.

Systems Test Supervisor

Candidates for this position should have 6 or more years in the computer industry with at least 3 years of technical management experience. Their field of expertise should be hardware final test, logic design, or field support of medium or large scale digital computers, preferably IBM 360/370 or compatible systems. A degree is highly desirable.

Although the past year has seen us grow, there's still room on the ground floor for individuals who seek a challenging, friendly, start-up environment. Our benefits package is excellent and you'll be well compensated for your efforts. Suitably qualified men and women should forward completed curriculum vitae to:

George Zukerman, Amdahl (UK) Limited,
Viking House, Lampton Road, Hounslow,
Middlesex TW9 1JQ. Tel: 01-872 4312

amdahl

FOP PRODUCTION DIVISION

Our Production Division has the largest commercial DEC 10 time sharing installation in Europe. We operate 8 DEC System 10's in the U.K. each with 256K memory, 200 Mbyte disks, magtapes, card readers, line printers and paper tape equipment. We support a comprehensive network throughout the U.K. and Europe and have a Transatlantic link to 12 DEC System 10's in the U.S.A.

COMPUTER AND PERIPHERAL ENGINEERS
up to £5.5K + car allowance

To be trained on and assist in the daily development of the systems backed up by junior and senior engineering staff. We are looking for experience on a wide range of peripherals plus a good background in chip level repair of memories and processors.

Contact by phone or letter CHRIS TURNER, Ext. 274 or 249.

SERVICE ENGINEERS ELECTRO/MECHANICAL
up to £3.8K

Required to work in Greater and Central London areas. A sound knowledge of electro-mechanical devices is essential and a good electronic background would be an advantage. If you have worked on Teletype 33/35's, needle matrix printers, telex equipment or thermal printers we will be eager to see you. Contact by phone or letter PAUL BARFIELD, Ext. 262.

OPERATIONS STAFF
up to £4.5K

We require all grades of Operators to work on our sophisticated systems. The total configuration is available 24-hours/day; 7 days/week and operates on a 2 shift system. If you have experience of supervising staff and are dynamic and intelligent then give us a ring for an informal discussion. Contact by phone or letter BOB CHRISTIANSEN, Ext. 250.

CUSTOMER SERVICE OFFICERS
up to £3.5K

We are looking for intelligent young people with a confident telephone manner who will respond to this important function in the Company. The job entails responsibility for the I/O control of all Media. We work a 2 shift system 0800-1800 and 1200-2000. We would expect you to have a good knowledge of operations/data control and a desire to operate peripheral equipment—printers/tape equipment/graph plotters, etc.

Contact by phone or letter KEITH ANDREWS, Ext. 201.

Or ring MAGGIE LEWIS, Ext. 249 who will take your name and telephone number and pass it on to the appropriate Manager.

The Company provides BUPA Pension Scheme and professional residential training and career development programmes. ON ANY OF THE ABOVE POSITIONS YOU CAN CONTACT PETER PEARCE (Recruitment Manager) OR HIS SECRETARY ANITA CAVALIER WHO CAN GIVE YOU MORE INFORMATION.

Ring: 01-637 1365 or write to FOP Network Services Limited, 179-193 Great Portland Street, London W1N 5TB

FOP SYSTEMS AND
PROGRAMMING DEPT.

Our Systems and Programming Department provides a professional implementation service to our Clients in the U.K. and EUROPE. We provide tailor made systems using a combination of programming packages and standard languages applied to business oriented applications.

We are looking for staff in LONDON, BIRMINGHAM and MANCHESTER and if you have a good Systems and Programming record with a COBOL and/or FORTRAN background then we will provide you with a wide variety of projects + on-line program development + close liaison with end users and the opportunity to work in a Company which is part of the largest bureau operation in the World. We are currently planning to double the size of the department and are seeking suitable candidates for the following positions:

SYSTEM CONSULTANTS
up to £6.5K

Must have significant systems design experience coupled with an active involvement with a sales force in a pre-sales role. They will conduct feasibility studies, prepare proposals and quotations for both fixed price and time and materials contracts and assist sales personnel in the presentation of these proposals. Similar experience will probably have been gained with a bureau, software house or manufacturer.

PROJECT LEADERS
up to £6K

Must be capable of controlling projects through all implementation stages against time and financial budgets, conducting progress meetings with clients, supervising training of users, and ensuring a smooth handover of projects.

ANALYST/PROGRAMMERS
up to £5K

Must be able to take responsibility for the detailed design of systems, and assist with their implementation. Previous experience with on-line applications would be useful.

PROGRAMMERS
up to £4K

Must have a minimum of 18 months practical experience gained in a formal programming environment and the ability to fit into an expanding team.

Contact BERNARD EDWARDS, Ext. 270.

Dep't 110

CHALLENGING MINI-COMPUTER DEVELOPMENT

(Overseas Relocation Opportunities)

SURREY

Our client's International Division is commencing a major prestigious project developing specialised commercial applications using COMMUNICATIONS and DATAMANAGEMENT techniques, utilising their latest range of mini equipment.

Circa £6,500

The new team being formed is to include:—

SENIOR PROGRAMMER/ANALYST

Your challenge will be to

- ★ Motivate and lead a small team of programmers.
- ★ Monitor team performance and schedule resources.
- ★ Liaise closely with the Systems Consultant in developing functional specs.

Both levels require experience of Real-time Mini applications. Equally, both represent exciting career opportunities as part of a Division with an enviable reputation for developing impressive and advanced systems.

2 PROGRAMMERS

You will need to

- ★ Rise to the challenge of new techniques.
- ★ Develop and test real-time programs with a minimum of supervision.
- ★ Possess Assembler level experience.

REF. 77/9/9

SPECIALIST COMPUTER RECRUITMENT LTD.

BIRMINGHAM 021-236 3781 FREEPOST
Freeport, Equity and Law House, 35-37 Great Charles Street Queensway, Birmingham B3 2BR

MANCHESTER 061-833 0676 FREEPOST
Freeport, Com Exchange Buildings, Corporation Street, Manchester M4 8BD

LONDON 01-935 0671 FREEPOST 6
Freeport 6, 102, Blandford Street, London W1E 1JZ



SCR

AA HINTONS

We are a public company involved in retailing in the North East of England operating over 50 outlets in the area.

We have recently upgraded our computer to a B3700 300K0 with 120m characters of LAK disc and the usual other peripherals.

Now we are embarking on extensive redesign of many of our systems and have vacancies for the following professional staff:

Systems Analyst

With a sound commercial and programming background, must be able to communicate with all levels of management.

Programmers

With a good grasp of programming techniques and at least one year's COBOL experience.

Multi-programming experience would be helpful but not essential.

Attractive salaries will be offered to the right applicants and bonus schemes are in operation.

Applications, giving details of career to date and when available for personal interview, to:

Mrs. S. K. List
Personnel Manager
AMOS HINTON & SONS LIMITED
P.O. Box 24, Master Road
THORNABY, Cleveland

UNIVERSITY OF OXFORD Department of Engineering Science

COMPUTER PROGRAMMER

required to assist with the research programme of the stellar group at the Culham Laboratory. The principal activity will be to develop new programmes or modify those written for other physical situations to model plasma behaviour in stellarator geometry, and to assist with software for data acquisition and processing. Supervision will be provided by Dr. R. N. Franklin but the person appointed would work mainly on Culham.

Applications are invited from graduates (mathematics, physics, or engineering), with experience in programming and numerical analysis. Salary according to age and experience on the Research Support Scale. TA £3393-£6627 per annum. The appointment would be for three years' fixed term.

Applications to the Administrator, Department of Engineering Science, Parks Road, Oxford, by 20th September, 1977.

AMERICA — EAST COAST

SALES EXECUTIVES ANALYST PROGRAMMING SUPPORT STAFF

The Company is a well known international supplier of computers, terminals and general business systems.

They will make new appointments for sales and support staff to complement a vigorous and exciting plan. Vacancies are at a number of the company's East Coast offices.

The positions offer above average incomes and moving expenses will be considered. A minimum of a two year contract of employment is envisaged and a positive career progression based on success can be expected.

Applicants should have experience of sales or support in terminals and systems, which might include DATAPOINT, SINGER 1500, SAUNDERS or Mini Computers such as BURROUGHS, NCR and ICL.

For further information, please contact immediately the advising consultant, quoting Reference CW148.



Insight Marketing & Personnel
Consultants Ltd.
72-75 Marylebone High Street
London W1M 4AJ
Telephone: 01-488 5644

METROPOLITAN BOROUGH OF KNOWSLEY Computer Section, Doppel Road, Kirby

COMPUTER PROGRAMMER

AP 3/4 £2822-£3702 + £312
5 Phase 2 Supplement

He or she will be involved in the maintenance of existing financial applications and with a development of further financial systems.

The installation comprises an I.C.L. 1801T Computer with communications devices. Both Plan and Cobol Languages are used.

Preference will be given to qualified applicants with at least two years' experience.

Ring 051-840 5855 or write to the Personnel Officer, Municipal Buildings, Civic Centre, Kirby, Liverpool L32 1TX.

Application form closing date 15th September 1977.

DUNDEE COLLEGE OF EDUCATION

ANALYST/PROGRAMMERS

Applications are invited from suitably experienced persons for two new posts in the Computer Centre, which is responsible for all computer services in the college. There are interesting opportunities in systems programming, and scientific and commercial applications, including library automation, on a recently installed DECsystem-20. Duties will include an advisory service to users.

Salary on the scale up to £4,344 with possible future advancement to a higher scale. Financial assistance towards the cost of removal expenses may be payable.

Further particulars and application forms may be obtained from the Administrative Assistant (Establishment), Dundee College of Technology, Bell Street, Dundee DD1 1HG, to whom completed applications should be returned by 18 September, 1977.

We have been chosen by one of the leading banks in the following countries:

SENIOR ANALYSTS

ANALYSTS

SENIOR DESIGNERS

DESIGNERS

SPECIALIST/SENIOR PROGRAMMERS

PROGRAMMERS

All to be based at London Surrey

Ring Stan 01-877 3021 for an immediate appointment PS

Appointments, 101 Mithras Lane, London, SW18.

CAPITAL APPLIES

COMPUTER SERVICE ENGINEERS

Please for free jobs list all areas

SAHARIS 14 1000

01-877 3021

01-877 3021

01-877 3021

01-877 3021

01-877 3021

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Edmund Howard's Client Album

TEST PROGRAMMERS HERTFORDSHIRE SALARY C. £5,000

Experienced programmers are required to work in the Product Test department of our Client's Software Development Headquarters. Main responsibilities will include developing tests and conducting trials of newly developed software prior to general release. The ability to write comprehensive reports and negotiate test objectives is essential.

Candidates should possess a practical approach to problem solving and an appreciation of the eventual users requirements which should reflect in the completed product. Rapid career advancement is envisaged for those with relevant experience wishing to capitalise on their present expertise. For further details please quote CW146.

DEVELOPMENT PROGRAMMERS HERTFORDSHIRE SALARY UP TO £6,000

One of the world's leading computer equipment manufacturers is currently recruiting experienced programmers to work on the development of new products within their European Software Development Group. Candidates' experience should stem from a computer manufacturing background with a strong bias towards assembly level programming. A working knowledge of Disc based systems plus some communications experience would be a decided advantage.

This is a unique opportunity to join a rapidly expanding department where you can develop your talents to the limit. Career prospects are excellent within the department. For further details please quote CW149.

SOFTWARE CONSULTANTS ESSEX (1903 going to 2960) C. £6,000

A leading manufacturer of precision engineering products is currently seeking a software specialist with at least five years' experience in systems programming. The person appointed will report to the C.S.M. and be responsible for software evaluation, software planning and maintenance and also the training of systems and programming staff in current software developments.

The company has plans to develop extensive real-time systems for its commercial and manufacturing activities. An ICL 2860 will be installed in a new computer suite towards the end of 1978 to support these developments and will utilise VME/B TPS 1900 and DME.

Current systems are based on an ICL 1903A running under GII+.

This is an ideal opportunity for someone who wants direct involvement in the software activities associated with a large scale real-time system. For further details please quote CW150.

TECHNICAL WRITERS HERTFORDSHIRE SALARY UP TO £5,500

Does your talent lie within the production of technical specifications and software manuals? If so, or even if you have no previous solid experience in a technical area, our client would like to meet you and perhaps offer you a more promising career.

Firstly, there are one or two qualifying factors. The Organisation concerned is a manufacturer of intelligent terminals and computer peripherals who strongly believe that its biggest asset is its employees. This healthy working environment enables them to produce one of the finest products around, which gives you a rare opportunity for career progression with exceptional security.

Our client asks for people with the right personality to tackle and solve all manner of problems in close association with the software design and product test teams, and with the enthusiasm to maintain a high standard of documentation at every stage of their development projects. For further details please quote CW151.

Edmund Howard & Partners Computer Personnel Consultants

5 Brighton Road, Surbiton, Surrey. Telephone 01-899 9183
38 Grafton Street, Dublin. Telephone 775 756

Holland Nijmegen

Initial Contract which could lead to permanent

- ★ But without the living costs of the larger better known cities
- ★ A progressive alert company with a DP unit committed to expansion
- ★ There is free tuition of the university language laboratory
- ★ A lively university town near the German border
- ★ Are looking for good staff who wish to live and work in Holland
- ★ Where applicable, for both married and single staff a relocation allowance would be made

Our clients believe that they have a lot to offer to the right people who are prepared not only to work for but to contribute to future developments of an unquestioned market leader. They require the following staff for both the DP unit and also a user department.

Programmers to FLS 35000 Programmer / Analyst to FLS 40000

If you have the following experience and are interested in these positions we would like to hear from you as soon as possible.

- Strong COBOL background (some RPGII would be useful).
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Our clients will be conducting interviews in the UK within the next 14 days.

Please apply without delay to Gordon Cairns quoting reference no. C/690.



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For a confidential discussion, please apply to Pat Convey quoting reference CW20

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We are looking for experienced Programmers to join an enthusiastic team who are currently involved in writing large complex data base systems.

Applicants should have reached an educational standard of not less than GCE 'A' level in two subjects, one of which should be mathematics. Preference will be given to men or women who have a working knowledge of IMS DB/DC DL/1 and COBOL language. Present hardware configuration comprises IBM 370/136, and 168.

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Norma Smith, Personnel Officer, Rolls Royce Limited, (Aero Division), P.O. Box 17, Pershore, Coventry CV1 2LZ. Tel: Coventry 27666 Ext. 336.

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If you are interested and would like further information please telephone the Senior Operations Supervisor on 01-837 3144 or write to Staff Appointments and Development Officer (Ref. 861/C), London Transport, 55 Broadway, London SW1H 9BD.

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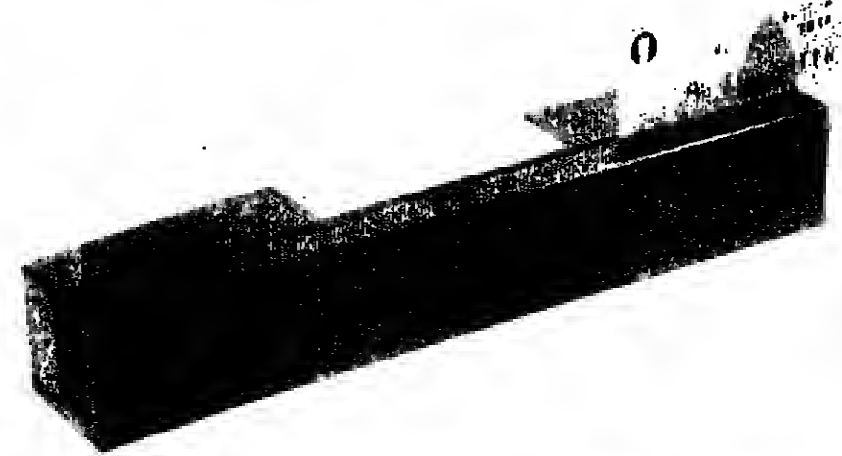
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RTZCS

PRODUCT NOTES



From Tekdata is a US-made manually operated magnetic strip card reader that it has introduced into the UK. Named Model 40, it is intended for low-cost capture of data from stand-alone peripherals and is pictured above.

The unit will read ABA, IATA or THRIFT tape on magnetically encoded cards with a strip-through action. A special magnetic head and a self-contained electronic package will provide standard CMTS or TTL output in the

form of a data stream and a strobe.

The Model 40 utilizes a head that is gimbal-mounted and individually suspended in a yoke by piezoelectric springs, said Tekdata. This assembly will provide precise head gap to card contact and thus minimize spacing losses and bit drop-out when cards are warped, dirty or old.

Tekdata Ltd (CW), Westport Lake, Canal Lane, Tunstall, Stoke on Trent, ST6 4PA. Tel: 0782 811711.

Integral punch/read on 30 chps terminal

FROM Data Dynamics is a 30 chps microcomputer controlled keyboard/printer terminal claimed to be the first with integral paper-tape punching and reading facilities.

Called the ZIP 30, the ASR terminal is built by the Data Dynamics subsidiary in France, Pacific SARL.

Data Dynamics quotes a one off price for the ZIP 30 of about £1,000 which the firm claims to be considerably less than the price of any other comparable

equipment combination on the market.

The ZIP 30, which is also available in KSR and RO versions, uses a seven needle matrix head to print upper case ASCII characters in the form of a 5 x 7 dot matrix. Lower case is optional. An original and up to three copies can be printed.

Data Dynamics points out that the ZIP 30 is a direct plug in replacement for the Teletype 33 and uses standard Teletype roll paper.

The ZIP 30 unit is supplied on the Continent with an "AZERTY" keyboard while UK models come with a "QWERTY" keyboard.

Data Dynamics Group Ltd (CW), Data House, Springfield Road, Hayes, Middlesex. Tel: 01-848 9781.

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Portable data logger

A PORTABLE cassette data logger designed to record data from Texas Instruments Silent 700 terminals is now available from Christie Electronics of Stroud, Gloucestershire. Called the CDLI100/5700, it is a development of the existing Christie CDLI100 logger.

The CDLI100/5700 can record data to Silent 700 standard from up to 100 channels and comes with interfacing and signal conditioning facilities for a wide range of input types, according to Christie. These include analogue, pulse, counter, parallel digital and change-over contacts.

The CDLI100/5700 comes with Nickel-Cadmium battery/meins power pack and an environmentally proofed enclosure and weighs 11 Kg (24 lbs). Suitable operating environments listed by Christie include laboratories, power stations, production lines, traffic and environmental study areas, oil rigs and ships.

Christie Electronics Ltd (CW), PO Box 18, Stroud, Gloucestershire, GL8 1NE. Tel: Stroud (048 38) 77908.

Magnetic cassettes

A RANGE of magnetic tape cassette units, the CS Series, has been introduced by Digital Peripherals of Painswick, Gloucestershire. The range includes read only, write only and read/write versions that are all based on the Facit 4204 cassette drive.

The CS Series units, which are plug compatible with all forms of paper tape punch/reader, will read or record to ISO 3407/ECMA 34 standard at speeds up to 800 chps.

Digital Peripherals says that the CS units are completely autonomous and require no change to a host computer's software, adding that conversion to the Texas Instruments Silent 700 recording standard is achieved by the operation of a single switch.

Plug in interfaces available with the CS Series include 8-bit parallel, RS 232 C, RS 232 20mA loop, Facit Universal and Facit SP1.

Other CS Series features include automatic error correction and control facilities as standard. Recorded data is validated by block length checks, drop in/drop out detection, timing error detection and cyclic redundancy tests.

Digital Peripherals Ltd (CW), Cheltenham Road, Painswick, Gloucestershire, GL6 6TS. Tel: Gloucester (0452) 812688.

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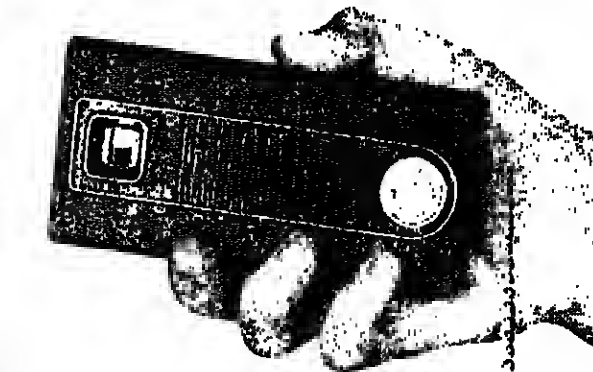
Digital Peripherals Ltd (CW), Cheltenham Road, Painswick, Gloucestershire, GL6 6TS. Tel: Gloucester (0452) 812688.

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A portable alarm that can be fitted to doors and windows has been introduced by Fonesdek of Harborne, Birmingham. It can be activated by a quick release chain and measures 5 1/2 x 1 1/2 inches. It is of solid state construction and is battery operated.

The price for the door unit (illustrated above) is £13.75. Models with protection for up to five points, including windows, are £14.80 each plus window points at £2.95 per pair. Names of local stockists are available from Fonesdek.

Fonesdek Ltd (CW), Albany Road, Harborne, Birmingham, B17 9JB. Tel: 021-427 2267.

Ring binder for DP stationery

DESIGNING effective ring binders for computer stationery has always been a complex problem. Small size (1 1/2 inch) marginal sprocket holes dictate the use of fine gauge wires for the mechanism.

The show bulk of multi-page print-outs necessitates large rings. Therefore conventional spring action mechanisms of reasonable capacity never work for long because the flimsy wires soon distort and fail to close properly.

Jetleys (Great Britain) has claimed to have solved this problem after 18 months development work. Its solution is the Datajet Speedscrew binder that is based upon a patented screw fitting instead of the traditional spring rings.

At its heart is a screw mechanism strong enough to pass the sprocket holes with ease and taking a 2 1/2 inch wad of print-out.

This is about three times the capacity of an old-style nominal one-inch ring binder and is held in place, without taping, by a specially-designed compressor bar.

Binder covers are also available in two standard sizes and

special sizes can be made to order.

Jetleys (Great Britain) Ltd (CW), 3-5 Astoria Mansions, Streatham High Road, London SW16 1PS. Tel: 01-877 3823.

Jetleys (Great Britain) Ltd (CW), 3-5 Astoria Mansions, Streatham High Road, London SW16 1PS. Tel: 01-877 3823.

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UK release for 42 x 60 digitiser

THE Summergraphic's 42 x 60 inch digitiser is now available in the UK from Terminal Display Systems of Blackburn, Lancashire.

Called the ID-60, it is based on the Intel 8080 microprocessor and is the largest in the Summergraphics range, sold TDS.

With an accuracy of ± 0.004 of one least significant bit, the ID-60 is available OEM and to end-users. TOS added that firmware features for the calculating area and perimeter are offered and skew correction, scaling, mirroring, zooming, windowing and rotation as standard graphic manipulation capabilities.

Interfaces now available include those for RS-232, TTY, Digital Equipment PDP-11, Data General Nova, Hewlett Packard HP-9800 series calculators and the IBM 029 punch.

Terminal Display Systems Ltd, Hillside, Whitebark Estate, Blackburn, BB1 5SN. Tel: 0254 882244.

Flooring

A MODULAR raised floor for computer rooms has been introduced by System Floors (UK). The new system incorporates several features which the company claims are unique and which ensure the suitability of the floor for computer installations.

Positive location of the support pedestals removes the danger of movement and enables each panel to be removed and replaced without difficulty.

The underside and edges of the panels are encased in steel, providing a high degree of fire protection while making the panels strong enough to meet computer manufacturers' load requirements.

The modules each measure 600 x 600 mm and are covered in non-slip carpet, vinyl or wood.

System Floors (UK) Ltd (CW), Midland Oak Trading Estate, Marlborough Road, Lymm, Cheshire WA16 6JH. Tel: 0203 061438.